FY 1999 Draft
Annual Implementation Work Plan

Volume I

Submitted by

Columbia Basin Fish & Wildlife Authority

to the

Northwest Power Planning Council

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Acknowledgements

The Columbia Basin Fish and Wildlife Authority would like to especially thank the following organizations for their help and resources in developing the FY 1999 Draft Annual Work Plan:

Northwest Power Planning Council
Bonneville Power Administration
StreamNet
Watershed Technical Workgroup
Non-Watershed Technical Workgroup
Fish Passage Center

I. Executive Summary

The tribal, state and federal entities of the Columbia Basin Fish and Wildlife Authority have responsibility under treaties and statutes for managing the fish and wildlife resources of the Columbia Basin and have explicitly set the following goal for fish and wildlife restoration.

A. Goal for Columbia Basin Fish and Wildlife Restoration

Restore sustainable, naturally producing fish and wildlife populations to support tribal and non-tribal harvest and cultural and economic practices. This goal will be achieved by restoring the biological integrity and the genetic diversity of the Columbia River ecosystem and through other measures that are compatible with naturally producing fish and wildlife populations. This goal is intended to fulfill the nation's and the region's obligations under treaties and executive orders with Northwest Indian tribes, treaties with Canada, and applicable resource protection, restoration and enhancement statutes and regulations.

B. Context for the FY 1999 Annual Implementation Work Plan

This FY 1999 Draft Annual Implementation Work Plan (DAIWP) details the actions (projects) that the managers' recommend take place during Fiscal Year 1999 to work toward this goal.

The DAIWP is one element of an inter-related group of planning components as outlined in Figure 1 (Section II). The actions recommended for FY 1999 carry out strategies developed for each subbasin (or subregion in some cases). The managers developed the strategies to achieve specific objectives, guided by regional sub-goals and principles. Section V summarizes these guiding sub-goals and principles and the subbasin objectives and strategies based on the Draft Multi-Year Implementation Plan (6/4/97) and the Draft Multi-Year Plan (2/7/98). Section V presents the subbasin strategies and the specific FY 1999 projects recommended complete them.

To estimate the funds needed for fish and wildlife during the next BPA rate period, the managers developed a Ten-Year Fish and Wildlife Budget. This budget forecast is based on the actions needed to carry out the strategies developed in the plans above. The DAIWP is a detailed expression of the annual budget summarized in the Ten-Year Budget.

The FY 1999 CBFWA DAIWP represents but a portion of the fish and wildlife managers regionwide activities. This portion of the fish and wildlife managers' activities is funded by the Bonneville Power Administration (Bonneville) to mitigate the impacts of the Federal Columbia River Power System under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 through the Bonneville direct Fish and Wildlife Program budget. In many cases, the Bonneville funding leverages additional funding from other sources for fish and wildlife protection, restoration, and enhancement.

C. Developing the Draft Annual Implementation Work Plan

The managers developed FY1999 DAIWP from several sources. Section II.C describes the process of selecting the recommended FY 1999 projects.

First, BPA solicited proposals for FY 1999 activities from the managers and the public in December 1997. BPA compiled the resulting 403 proposals in a common database in late February 1998, providing access to CBFWA, ISRP, NPPC and the public.

The managers divided the proposals into watershed and non-watershed projects. The managers established a Watershed Technical Work Group to evaluate the watershed proposals relative to a set of criteria to determine technical feasibility (Volume III).

The proposals were divided among the three caucuses for additional technical and management review. The management criteria used are an expression of the goals, principles, objectives and strategies summarized in Section IV. The Anadromous Fish Managers sent the anadromous fish proposals to Sub-Regional Teams for management review. The managers then placed each proposal in one of three groups: Tier 1 – recommended for funding in FY 1999; Tier 2 – recommended for funding, pending sufficient additional funds; and Tier 3 – not recommended for funding in FY 1999. Tables 3, 4 and 5 list the proposal recommendations.

As a final step, since the needs exceed the available funding, the managers recommended changes in the proposals to balance the budget. Section V describes these modifications in the individual project summaries.

The managers are committed to multi-year budgeting for on-going projects. However, additional work is needed on criteria for choosing appropriate projects and conditions that would trigger their review. The managers will work with the NPPC, BPA, PPC, ISRP, and others to develop suggestions for how multi-year budgeting might work most effectively.

D. Fish and Wildlife Balanced Budget

Consistent with the regional goals, objectives and strategies, the managers recommend a budget totaling $132,139,423 for FY 1999 (see Table 1). The M.O.A. Direct BPA budget amount of $127 million should be augmented with $1,600,000 from the Contingency/Inflation Reserve, $2,139,423 in un-obligated FY 1998 project funds, and $1,400,000 in estimated interest on FY 1998 funds.

The proposed budget allocates $91,975,000 to anadromous fish projects, $16,366,423 to resident fish projects, $15,298,000 to wildlife projects and $8,500,000 to support BPA and ISRP activities. Table 2 outlines the basis for these allocations.

E. Anadromous Fish Recommendations

For FY 1999 project funding recommendations, the Anadromous Fish Managers continued the intentions they stated in the FY 1998 work plan. The conceptual foundation, the sub-regional and subbasin framework, and management objectives and strategies continue to be refined in each subbasin in order to mitigate fish and wildlife losses from the Federal Columbia River Power System.

The Anadromous Fish Managers have articulated their goals for the Columbia River Basin and for individual subbasins within the region. These goals are set high, and will take many years and funds to achieve. In each subbasin, target species are identified, and the resource condition, problems and limiting factors are described.

The managers articulate the objectives that are a measurable, outcome based expression of the work that needs to be done in order to correct the identified problems. Based on these measurable objectives, the co-managers have agreed to strategies that they believe will achieve those objectives. These strategies or strategic approaches are also articulated in the subbasin/sub-regional summaries.

In order to implement these strategies, the co-managers have defined, and are recommending implementation of specific actions (projects).

The work plan is a multi-year plan, in that many of the recommended projects will require more than one year of funding to implement the projects. The CBFWA anticipates working with the NPPC, BPA, and the ISRP to define which projects and/or portions of projects will be reviewed annually to develop each year's funding recommendations.

For FY 1999, anadromous fish project proposals were first evaluated with technical criteria (see Volume III,B). The technical review determined if the project proposal was complete, and whether the project was technically feasible.

The next step included sub-regional teams of anadromous fish managers and locally-involved entities and project sponsors which reviewed the proposals with management criteria that are aimed at determining if the project is critical, threshold, and most urgent for achieving the management goals and objectives, consistent with agreed upon management strategies.

Throughout these reviews, the AFM used the goals, objectives, strategies to define those actions that are most critical for protection, enhancement, and recovery of the anadromous fish resource in order to attempt to mitigate a small portion of the damage caused by the FCRPS.

The final AFM budget recommendation is $91,942,116 of the $91,975,000.

F. Resident Fish Recommendations

The FY 1999 Resident Fish Draft Annual Implementation Work Plan (DAIWP) reflects the Multi-Year Implementation Plan (CBFWA, June 4, 1997, pp. 118-254) which addresses the resident fish losses caused by the construction and operation of the Federal Columbia River Power System. This DAIWP is the result of a multi-step process that merged the goals, objectives, strategies, and performance standards outlined in the MYIP with the caucus-level technical, management and fiscal reviews. The resident fish goals, objectives, and strategies are summarized in Sections IV and V of Volume I. Volume III,C Appendices provide a detailed account of the project evaluation process. Tables 3-5 summarize the RFM recommendations.

For FY 1999, the Resident Fish Managers (RFM) recommend funding 50 high priority projects totaling $16.3 million. The 45 ongoing projects continue work to address native and non-native species in native and non-native habitats throughout the basin. Two of the five new projects mitigate for excessive drawdown at Libby and Hungry Horse dams. BPA funded these projects from the Power Supply budget in previous years but shifted them to the Direct Fish and Wildlife Program in 1999. Two other new projects study bull trout in the North Fork of the Malheur River and on the Washington side of the Columbia Gorge. The fifth new project assesses sturgeon genetics in the Columbia Basin.

G. Wildlife Recommendations

The goal of the CBFWA Wildlife Caucus is to achieve and sustain levels of habitat and species productivity in order to mitigate fully for the wildlife losses that have resulted from the construction and operation of the federal and nonfederal hydroelectric system in the Columbia River Basin. The hydropower-induced wildlife losses due to inundation have been quantified and are included in the NPPC Fish and Wildlife Program. Specific objectives and strategies of the Wildlife Caucus include protecting and enhancing the habitat types indicated in the NPPC Fish and Wildlife Program. Additional details are in Section IV of this work plan.

The Wildlife Caucus implements these goals by prioritizing and recommending for funding various wildlife mitigation projects each fiscal year, using Wildlife Mitigation Criteria called for, and approved by, in the NPPC. The criteria include technical and management considerations and can be found in Volume III,D. The caucus also reviewed and adjusted project budgets to allow the entire suite of qualified wildlife projects to move forward in FY 1999 at some level. The FY 1999 Wildlife Review Process is outlined in Section II.D.4 of this work plan.

Overall, the Wildlife Caucus evaluated 42 wildlife project proposals. The $15 million FY 1999 Wildlife work plan comprises 21 projects that acquire, maintain, or coordinate the acquisition and maintenance of wildlife habitat units, as outlined in the goals and objectives of the Wildlife Plan. Operation and maintenance efforts continue where acquisitions or easements have been completed. Ongoing efforts directed at securing

new easements and acquisitions, (for example, in Southern Idaho, the Yakima basin, and the Albeni Falls area) continue to be funded on a year to year basis. FY 1999 marks the first year of implementation of the suite of new projects developed and prioritized by the Oregon Wildlife Coalition, including acquisitions along Pine Creek and the Malheur River. In addition to the Oregon Coalition projects, new projects are proposed on Crab Creek in Washington and the Sandy River Delta in Oregon. Beginning in FY 1998, and continuing in FY 1999, the caucus will develop a monitoring and evaluation (M&E) plan. The M&E plan will incorporate community-based, species richness and diversity models and direct population monitoring into the program. The caucus also will begin efforts at identifying, quantifying, and addressing operational and secondary hydropower impacts to wildlife in FY 1999. A full accounting of the FY 1999 Wildlife Caucus recommendations can be found in Tables 3, 4, and 5; and detailed justifications in Volume III,D.

II. Introduction

A. Overview

This FY 1999 Draft Annual Implementation Workplan is composed of three volumes. Volume I provides the project recommendations, regional recommendations, and subregional summaries, as outlined below. Volume II lists one-page descriptions for recommended projects, sorted in the same order as Volume I, Section V. Volume III is a set of appendices which provide detail on the project selection process. This process incorporates technical management and fiscal criteria.

1) Section II.B outlines the management framework and context behind the FY 1999 review process, citing specific planning documents and highlighting some of the organizational connections and processes between management entities. Figure 1 presents these processes in graphic format.

2) Section II.C proposes the need for multi-year funding of projects which meet agreed upon selection criteria.

3) Section II.D describes the FY 1999 project evaluation process in greater detail, including information specific to each caucus.

4) Section III contains the project recommendations. Section III.A, Tables 1 and 2 provide the broad budget overview, show funding sources and the balanced budget allocation. Section III.B consists of graphs and tables describing the CBFWA project recommendations. Figure 2 shows the relative magnitude of projects proposed for funding versus projects CBFWA has recommended for funding. Figures 3 and 4 provide the same information sorted by subregion. Tables 3-5 in Section 0 provide the CBFWA project recommendations sorted by Tier, Caucus, and Subregion. Table 6 lists projects and subregions sorted by BPA project number to serve as a cross-reference. Section III.C is a graphical and narrative analysis of BPA requested and CBFWA recommended projects sorted by program area and by program emphasis.

5) Sections IV and V contain region, subregion and subbasin management summaries. Section IV also describes the Columbia Basin fish and wildlife restoration goal, with regional principles for anadromous, resident fish and wildlife objectives.

6) Section VI explains a new approach to funding regional coordination.

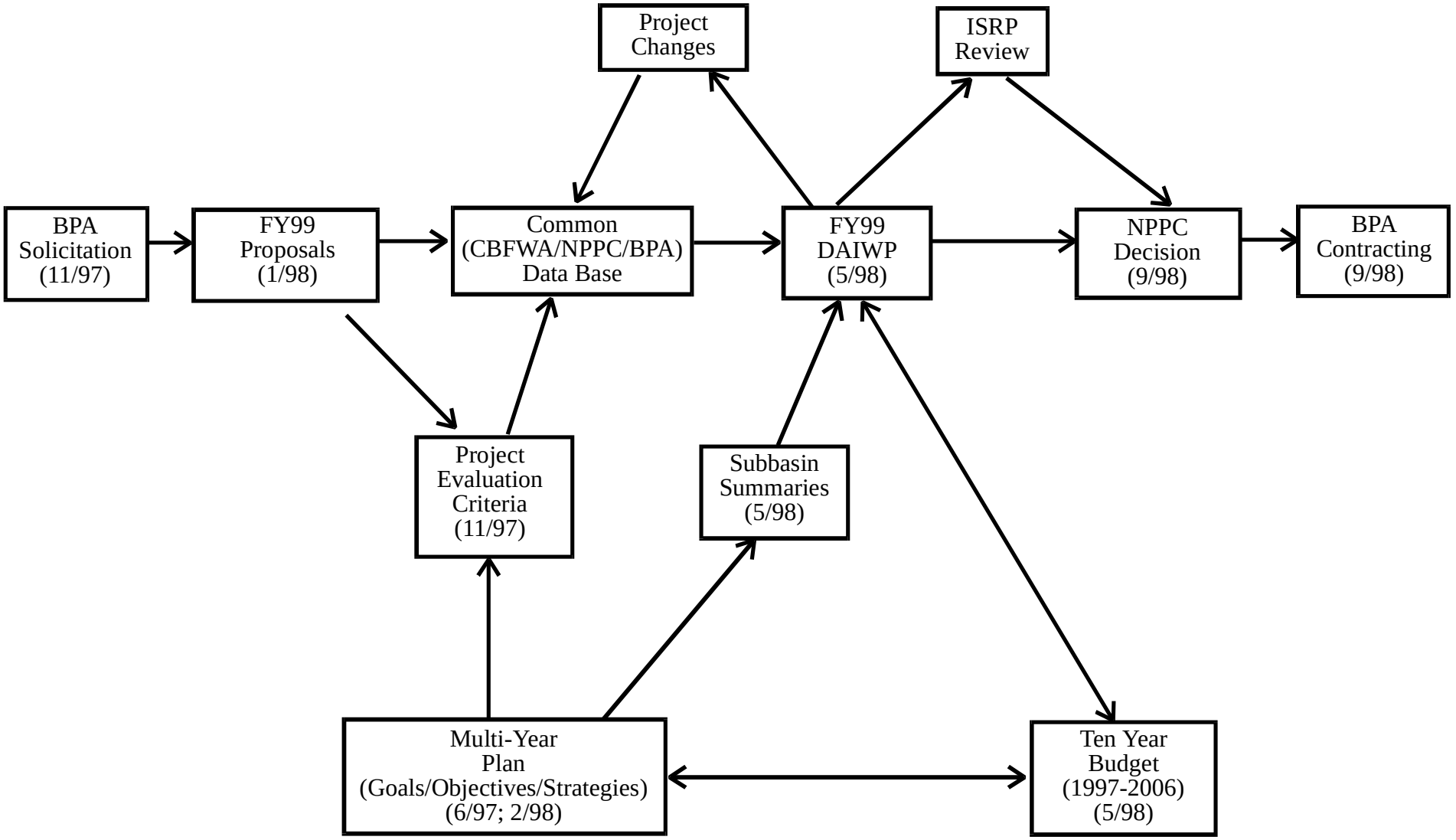
7) Volume II contains one-page project descriptions, sorted by subregion, subbasin, focus and project ID (following the same order as Section V).

B. Management Framework and Context

1) The CBFWA Draft Annual Implementation Work Plan for FY 1999 (DAIWP) is one element of an interrelated group of fish and wildlife planning components (Figure 1) including:

∃ Multi-Year Implementation Plan (MYIP)

Figure 1. Planning components that provide the context for the FY 1999 DAIWP



∃ Draft Ten Year Budget

∃ Project Evaluation Criteria

∃ Common Project Data Base

∃ Public process to evaluate proposals

2) The FY 1999 DAIWP describes the process used by the fish and wildlife managers to develop their project recommendations.

3) The FY 1999 DAIWP outlines the recommendations of the CBFWA Members (responsible for managing fish and wildlife resources in the Columbia River Basin) on projects BPA should implement with the Direct Fish and Wildlife Budget each year.

4) The managers use a set of technical and management criteria to evaluate the FY 1999 proposals. These project evaluation criteria are an expression of the goals, objectives, and strategies outlined in the Multi Year Plan. BPA incorporated the Independent Scientific Review Panel (ISRP) and the Watershed criteria in the solicitation for FY 1999 proposals so that respondents would understand how the proposals would be evaluated.

5) The FY 1999 proposals are compiled in a common project database used by CBFWA, NPPC, and BPA. Staff from the three agencies work collaboratively to maintain the database and draw data from it for each agency's separate analyses.

6) In the public process to evaluate proposals, BPA solicited FY 1999 proposals, staff compiled these into a common database, and managers evaluated proposals relative to the criteria and compiled the FY 1999 DAIWP. The development of the FY 1999 DAIWP was consistent with the Ten Year Budget. The FY 1998 DAIWP (June 4, 1997) outlines the general process.

7) The DAIWP is reviewed each year by the ISRP and the public. Based on the reviews, the NPPC provides its recommendation to BPA for funding.

8) The Draft Multi-Year Plan (MYP) describes the fish and wildlife managers management goals; subbasin (or subregional) objectives to work toward the goals; and strategies to meet the objectives. The FY 1998 DAIWP (June 4, 1997) provides a good outline of the MYP framework and details the anadromous fish, resident fish and wildlife draft goals, objectives and strategies. The draft subbasin objectives and strategies for anadromous fish are outlined in the "Draft Multi-Year Anadromous Fish Plan" (February 7, 1998). The FY 1999 DAIWP, to be presented on May 13, 1998, identifies the actions proposed to carry out the subbasin strategies.

9) The Draft Ten-Year Budget (April 20, 1998) provides the managers= forecast of budgets needed to carry out the MYP. The FY 1999 DAIWP provides a detailed break down of one year out of the Ten-Year Budget. The budget forecast is based on several major policy assumptions that are also identified in the MYP and will be presented on May 13, 1998.

10) These elements of the fish and wildlife managers= planning components are available in draft (see References below) and will be revised: 1) as policy decisions are made; 2) to address technical concerns; and 3) to improve their consistency and clarity.

11) Reference material which provides necessary background for the FY99 recommendations are as follows:

CBFWA, April 1998. FY 1999 Resident Fish Project Evaluation.

CBFWA, March 1998. FY 1999 Watershed Project Technical Evaluation. 38p.

CBFWA, March 1998. Non-Watershed Technical Work Group Report.

CBFWA, March 1998. Resident Fish Project Evaluation Criteria. 4p.

CBFWA, June 1997. Draft Multi-Year Implementation Plan: For the Protection, Restoration, and Enhancement of the Columbia River Basin Fish and Wildlife Resources. 574p.

CBFWA, June 4, 1997. Draft FY 1998 Annual Implementation Work Plan. 289p.

DRAFT, February 7, 1998. AMulti-Year Anadromous Fish Plan.≅ Presented to the CBFWA Members Meeting. 115p.

DRAFT, April 20, 1998. ADraft Ten Year Fish and Wildlife Budget.≅ Presented to the CBFWA Members. 8p.

NPPC, February 11, 1997. Wildlife Mitigation Criteria.

C. Multi Year Funding

The members of CBFWA support the concept of multi-year budgeting. This idea is based on the premise that some kinds of program implementation efforts will take more than one year to accomplish and their fiscal needs should be planned for over the life of the project. Types of projects that might lend themselves to this approach include the construction of major facilities and budgeting for long-term operations and maintenance costs, and certain multi-year research projects.

The fish and wildlife managers have started discussing the multi-year budgeting concept and how it might work from their point of view. They will bring some ideas forward this spring to start the development of this approach for the FY 2000 process. The mangers want to develop and implement multi-year budgeting in a collaborative fashion with the NPPC, BPA, ISRP, and other interested parties.

With appropriate accountability for spending and results, multi-year budgeting could provide greater fiscal certainty and stability for projects, better long-term budgeting, and less extensive annual reviews.

D. FY 1999 Project Evaluation Process

Between mid February and mid April 1998, the Columbia Basin Fish and Wildlife Authority (CBFWA) evaluated each proposed FY 1999 project. The projects were directed to one or more of the evaluation teams according to the sponsor's designation of programmatic category and project type (anadromous fish, resident fish, wildlife, watershed, etc). The Watershed Technical Work Group (WTWG) evaluated the technical merits of "watershed projects" while the CBFWA caucuses evaluated the technical, management, and fiscal aspects of all of the proposed projects. A brief summary of the evaluation process follows.

1. Watershed Technical Workgroup

Watershed projects were reviewed by the WTWG in mid February and their report (in Volume III) describes the review process and results in detail. To summarize, the WTWG concluded 34 proposals were technically sound as submitted. They also recommended that another 104 proposals needed additional information and 74 of those sponsors took advantage of the opportunity to provide revised proposals. The high number of proposals needed to provide additional information is primarily a product of the elevated scrutiny placed on these proposals due to the new watershed project selection process and criteria; and, the fact that the proposal solicitation did not allow time for improvements that resulted from the first year of the new process (FY 1998) to be implemented into the original FY 1999 proposals. The revisions were distributed to the NPPC, ISRP, the Anadromous Fish Managers and Subregional teams, the Resident Fish Managers, and the Wildlife Managers for further review.

2. Anadromous Fish Managers Review

The Anadromous Fish Managers (AFM) used a multiple step process to evaluate anadromous fish proposals. As mentioned above, the technical merits of the watershed projects were evaluated by the WTWG. To assess the technical merits of the 170 non-watershed projects, the AFM created a Non-Watershed Technical Work Group (NTWG). The NTWG report (in Volume III) identified 107 technically sound proposals and suggested that another 63 had technical deficiencies or needed additional information. Sponsors had the opportunity to provide additional information through an AFM subregional team management review process. To facilitate the management-level review and to build on the WTWG and NTWG evaluations, the AFM established 7 Subregional Teams (SRTs). The SRTs applied the Integrated Watershed CBFWA

Caucus Criteria to watershed projects and the Non-watershed Management Criteria to the non-watershed projects and presented a three-tiered recommendation to the AFM (Volume III).

Next, the AFM scrutinized the project proposals to determine if priority life stages and/or habitat would be lost if the proposed actions were not implemented. To complete the process, the AFM approved a suite of high priority projects that reflect the WTWG, NTWG, SRT, and AFM recommendations and fall within the budget target of $87,775,000.

For FY 1999, the AFM recommend a prioritized list of projects, organized by subbasin, and prioritizing by Tier in which:

- Tier 1 projects are recommended for funding because they are urgent and most critical to protecting, restoring and enhancing anadromous fish and their habitats;

- Tier 2 projects are also critical but funds are not currently available; and

- Tier 3 projects are not recommended for funding because the projects are not critical or urgent.

3. Resident Fish Managers Review

For Fiscal Year 1999, the Resident Fish Managers (RFM) also used a multi-phased process to evaluate proposals. To guide the project review process, the RFM developed criteria (organized into three categories - Screening, Technical, and Programmatic) designed to evaluate the technical and programmatic merits of the proposals (Volume III). The Screening Criteria were intended to ensure that the proposed projects addressed the measures and priorities in the Council's Program and were consistent with the management objectives of the Agencies and Tribes. The Technical Criteria assessed the proposed project's technical merit, objectives, monitoring, and benefits. The Programmatic Criteria dealt with the broader scientific, regional and strategic aspects of the proposed projects.

Between March 30 and April 1, 1998, the RFM met in Spokane, Washington to evaluate 68 proposed resident fish projects (including 12 watershed projects). To speed up the actual review process, the criteria were combined into the three categories on the score sheet. Each project was allotted 15 minutes - 5 minutes for the sponsor to describe the project followed by 10 minutes of questions and answers (Volume III). During the presentation/discussion, each RFM assigned a "Yes" or a "No" to each of the three general criteria categories. After all of the projects had been reviewed, the individual criteria score sheets were compiled into a single matrix. The RFM then discussed the proposals again and came to a consensus "Yes" or "No" for each criteria category for each project (Volume III). During the discussion, the project sponsor was not allowed to provide additional information and/or object to the final "Yes"/"No" decision. Proposed projects that had a "Yes" in all three criteria categories were then designated as Status 1. Those that had a combination of "Yeses" and "Nos" fell into Status 2 and finally, projects

that received a "No" for the Screening Criteria and/or received "Nos" in all three categories were assigned Status 3. Status 4 covered a few miscellaneous projects where the funding request was either withdrawn by the sponsor, transferred to another project, or the project was not evaluated because the NPPC had previously not recommended funding.

The RFM met via conference call on April 6, 10, and 13 to select high priority projects that fit within the RFM budget of $16,366,423 ($15,725,000 FY 1999 starting point plus $641,423 unallocated balance).

The final RFM FY 1999 recommendations constitute a prioritized list of projects in which:

- Tier 1 projects are recommended for funding because they are urgent and most critical to protecting, restoring and enhancing resident fish and their habitats;

- Tier 2 projects are "pending" and should be funded as money becomes available in the future; and

- Tier 3 projects are not recommended for funding because of technical and programmatic concerns.

4. Wildlife Managers Review

The Wildlife Managers (WM) reviewed and scored each FY 1999 wildlife proposal using the Council-approved Wildlife Mitigation Criteria (dated February 11, 1997), which address both technical and management issues. Wildlife project proposal sponsors were contacted in late February and invited to attend one of two project evaluation sessions (March 19-20 in Portland, April 6-8 in Spokane). Proposal sponsors were provided with the criteria questions and encouraged to respond to them in writing. (These responses and other additional information obtained during the project selection process will be provided to the ISRP and are available upon request.) Project sponsors were present during the evaluation to provide an overview of their project and answer questions from the caucus. Seven wildlife proposals were also reviewed by the WTWG. Information generated in the WTWG review was considered on an advisory basis by the wildlife caucus.

The result of the WM review process is a prioritized list of projects in which:

- Tier 1 projects are recommended for funding because they meet the Caucus' and Council's goals of acquiring, protecting and enhancing wildlife habitat to mitigate hydropower-induced wildlife losses in the most biologically- and cost-effective manner.

- Tier 2, Level 1 (not designated separately in Table 4) consists of the amounts by which certain projects' budgets were reduced in order to include the entire suite of qualified wildlife projects in Tier 1. The caucus will reallocate funds that become

available through the BPA Quarterly Review Process to make these projects whole.

- Tier 2, Level 2 consists of one project that is approved for funding only if a substantial amount of new funds become available to the caucus. The Wildlife caucus is developing a programmatic approach to implementing trust funds.
- Tier 3 projects are not recommended for funding because they are inconsistent with the wildlife program and/or have other technical deficiencies.

III. Recommendations

A. Fish and Wildlife Balanced Budget

The CBFWA Fiscal Year 1999 Fish and Wildlife Draft Annual Implementation Work Plan presents the budget in several levels of detail and in several formats. First, Table 1 provides an overview of the sources and distribution of the proposed $132,139,423 budget. Under the BPA Budget M.O.A., BPA makes $127,000,000 available annually to fund the Direct portion of the fish and wildlife program. CBFWA recommends adding approximately $5 million from the Contingency/Inflation Reserve, FY 1998 carry forward, and estimated FY 1998 interest. The bottom half of Table 1 outlines the general CBFWA recommendation for distributing the funds among the Anadromous Fish, Resident Fish, and Wildlife caucuses and to BPA and ISRP.

Table 1. Funding Sources and Distribution

FUNDING SOURCES			
Direct F & W Budget	$127,000,000		
		$1,600,000	Note 1
		$2,139,423	Note 2
		$1,400,000	Note 3
Additions to the FY99 Budget	$5,139,423		
Total Available	**$132,139,423**		
FUNDING DISTRIBUTION			
Anadromous	$91,975,000		
Resident Fish	$16,366,423		
Wildlife	$15,298,000		
BPA/ISRP	$8,500,000		
Total Allocated	**$132,139,423**		

Note 1	Contribution from Contingency/Inflation Reserve
Note 2	Estimated FY 1998 Carry Forward (Anad., Res., Wildl.)
Note 3	Estimated Interest on Unobligated FY 1998 Funds (Anad. only)

Table 2 outlines the CBFWA internal allocation of the available funds among the caucuses. CBFWA subtracted the BPA administrative and part of the ISRP costs from the M.O.A. Direct budget, along with the estimated Anadromous and Resident Fish ESA costs to arrive at an estimated mitigation budget of $91,500,000. This mitigation budget is divided among the three caucuses on a 70:15:15 basis and the ESA funds are added back to the Anadromous and Resident Fish budgets. The CBFWA Members agreed to this general allocation at its May 5, 1996 meeting. The Members Steering Group agreed in May 1997 that the Wildlife Caucus budget should be at least $15,000,000, so in this allocation CBFWA transfers $1,275,000 from the Anadromous Caucus to the Wildlife Caucus. This results in a target of $87,775,000 for the Anadromous Fish budget.

CBFWA added $2,139,423 estimated carry forward funds from FY 1998 to the three caucus budgets, $1,400,000 estimated interest on unobligated FY 1998 funds, and $1,600,000 from the "contingency/inflation reserve."

Table 2. Budget Allocation

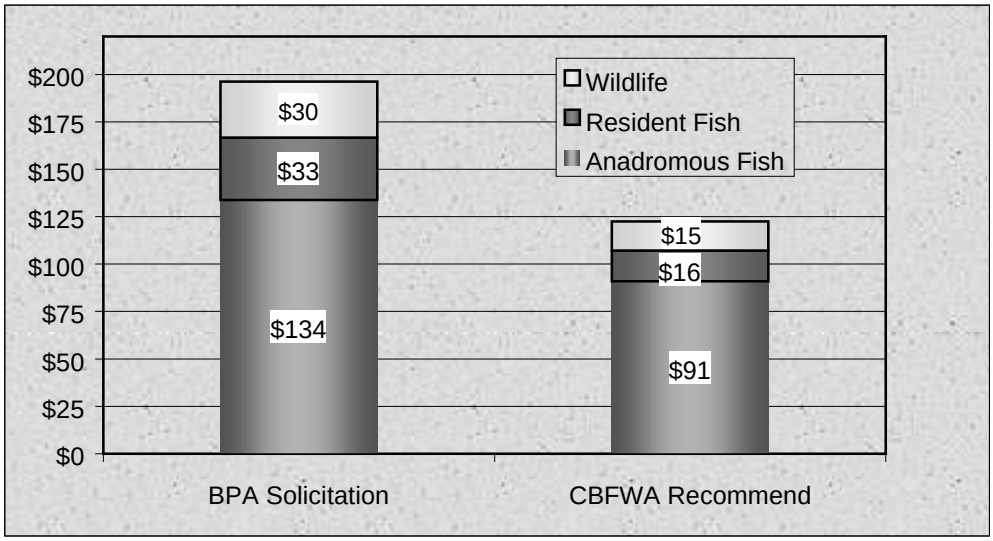
Direct F & W Budget		$127,000,000	
Less Anadromous ESA		($25,000,000)	
Less Resident Fish ESA		($2,000,000)	
Less BPA Administrative Costs		($8,000,000)	
Less ISRP Costs		($500,000)	
F & W Mitigation Budget		$91,500,000	
Anadromous Fish			
Anadromous Portion (70%)		$64,050,000	
Anadromous ESA - Add-Back		$25,000,000	
Transfer to Wildlife		($1,275,000)	
Subtotal		$87,775,000	
Contribution from Contingency/Inflation Reserve		$1,600,000	
Estimated FY98 Carry Forward		$1,200,000	e.g., Law Enforcement reductions
Estimated Interest on Unobligated FY 1998 Funds		$1,400,000	70% of $2M est. Interest
Available for Anadromous Fish		**$91,975,000**	
Recommended Anadromous Fish Funding		**$90,942,116**	See Table 3
Placeholder for Steelhead Biological Opinion	($1,000,000)		
Anadromous Fish Balance	$32,884		
Resident Fish			
Resident Fish Portion (15%)		$13,725,000	
Resident Fish (ESA) - Add Back		$2,000,000	
FY98 Unallocated Balance		$641,423	
Available for Resident Fish		**$16,366,423**	
Recommended Resident Fish Funding		**$16,205,701**	See Table 3
Resident Fish Balance	$160,722		
Wildlife			
Wildlife Portion (15%)		$13,725,000	
FY98 Carry Forward		$298,000	(#9701200, #9705915)
Transfer from Anadromous		$1,275,000	
Available for Wildlife		**$15,298,000**	
Recommended Wildlife Funding		**$15,300,660**	See Table 3
Wildlife Balance	($2,660)		

B. FY 1999 Project Recommendations

1. FY 1999 Project Recommendation Summary

As shown in Tables 1 and 2, the available FY 1999 Direct Budget is $132,039,423. However, in response to the November 21, 1998 solicitation, BPA received 403 proposals totaling $196,294,850. Figure 2 compares the total amount requested by the proposal sponsors (BPA Solicitation) to the amount recommended by CBFWA (CBFWA Recommend). It is evident that the need for fish and wildlife mitigation exceeds the funds available to each caucus, therefore many of the proposed projects received less than the requested amount or were not recommended for funding.

Figure 2. Comparison of BPA Solicitations and CBFWA Recommendations



To provide more detail than possible in Figure 2 and a graphic illustration of Table 3, Figures 3 and 4 show the relative distribution of FY 1999 funding requests and CBFWA recommendations across caucuses and subregions. As shown, CBFWA recommends funding most of the anadromous fish projects in the Lower Mid-Columbia, Upper Mid-Columbia, Lower Snake, and Systemwide subregions. The bulk of the recommended resident fish projects fall into the Upper Columbia, Upper Snake, Lower Snake, and Lower Mid-Columbia subregions. For wildlife, the majority of the recommended projects will be implemented in the Upper Mid-Columbia, Upper Columbia, Upper Snake, and Systemwide subregions. The wildlife portion of the Systemwide subregion comprises projects that will be implemented in multiple subregions within Washington and Oregon under those states' wildlife agreements.

Figure 3. BPA Solicitation by Subregion

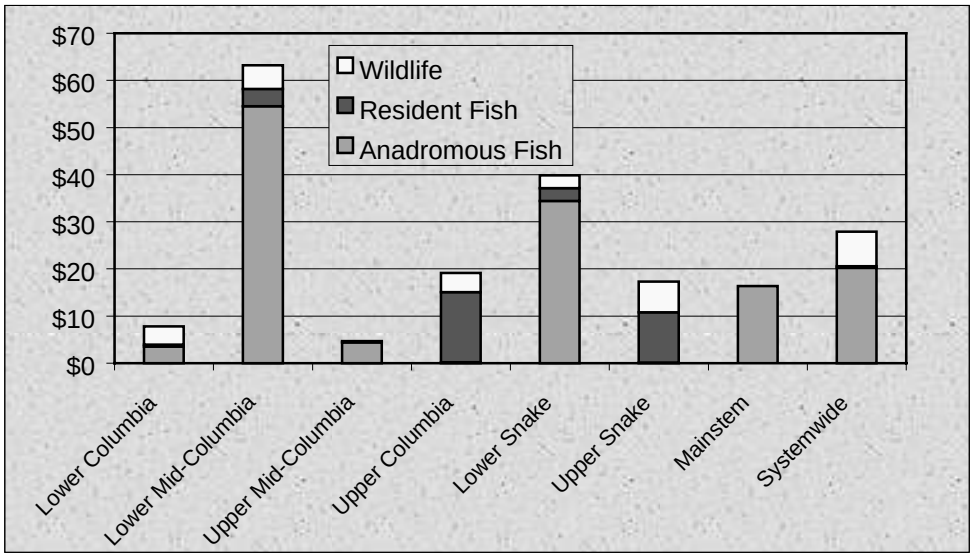
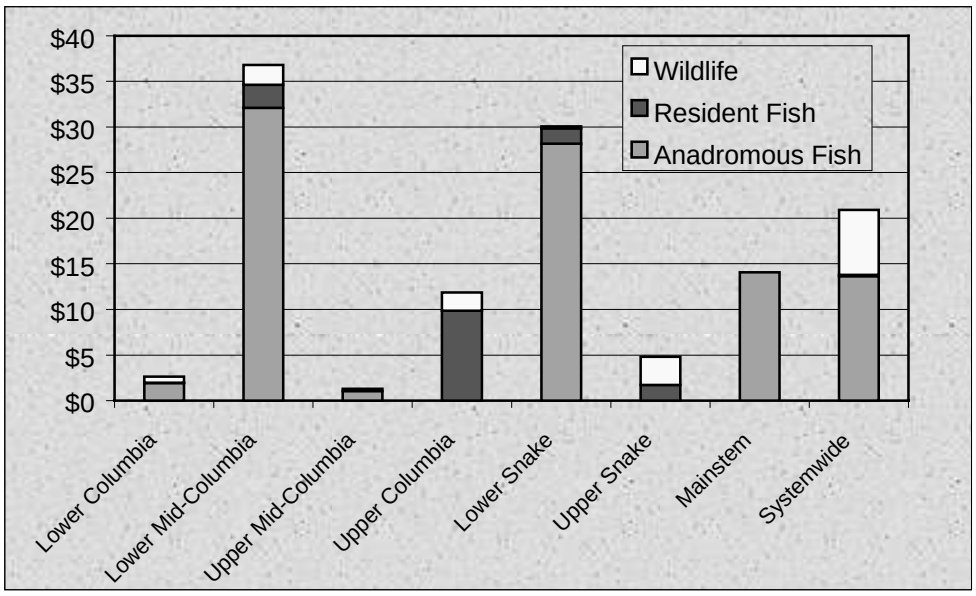


Figure 4. CBFWA Recommendation by Subregion



2. Budget Recommendation Tables

In Table 3, the projects recommended for funding in FY 1999 are sorted by caucus (Anadromous Fish, Resident Fish and Wildlife), subregion, and subbasin. Subregions are defined as: Lower Columbia (below Bonneville Dam); Lower Mid-Columbia (Bonneville Dam to Priest Rapids Dam); Upper-Mid Columbia (Priest Rapids Dam to Chief Joseph Dam); Upper Columbia (above Chief Joseph Dam); Lower Snake River (below Hells Canyon Dam); Upper Snake River (above Hells Canyon Dam); and Systemwide (two or

more subregions). The table displays project title, sponsor, requested budget (as reported in the project proposal), the CBFWA recommended FY 1999 budget, and outyear costs for FY00 and FY01. Notes are also provided in Table 3 to explain any differences between the BPA requested FY 1999 budget and the CBFWA recommended FY 1999 budget.

In order to be more effective and accountable in dealing with program requirements, the budget is presented on a multi-year basis through FY 2001. The out-year costs (FY00 and FY01) provide a logical foundation for establishing a rolling three-year budget, where the total available funds through FY 2001 can be managed as a total program. The CBFWA is committed to further refining the out-year cost estimates and defining actions that will trigger multi-year project reviews in order to assure that the managers continue to allocate resources to meet priority needs while providing flexibility to meet new or unanticipated program requirements on a multi-year basis.

The CBFWA recommends that an additional $500,000 be allocated to project #8906200 (Prepare Draft Annual Implementation Work Plan) in order to partially offset costs to the CBFWA members for participation in regional planning and implementation forums. The justification and approach for this funding is presented in Volume III.

"The CBFWA recommends setting aside a total of $1,742,000… on a recommendation to the Council. The evaluation is intended to determine if the proposed enforcement work is critical to achieving the objectives of the fish managers while staying consistent with the Council guidelines established in September, 1997 (Helena, Montana) and reaffirmed in February, 1998 (Boise, Idaho). The Council's recommendation is as follows: "The Council will consider proposals to fund specific law enforcement tasks that are tied to the core purposes of the Act, do not present an "in-lieu" issue under the Act, and are associated with activities funded under the Council's program, such as protecting habitat investments." (NPPC 97-14, pg.34).

Tables 4 and 5 present the projects that were evaluated and are either recommended for funding pending budget availability (tier 2); or are not recommended for funding (tier 3). The CBFWA has not yet defined a final recommended budget amount for pending projects, except for project #9093, which has been identified as the highest priority pending project for Resident Fish ($250,000 in FY 1999 as soon as the funds become available). Notes are also provided to highlight issues that contributed to the recommendation.

Table 6 lists projects by project identification number and is provided as a cross-reference.

Table 3 . FY99 Tier 1 Projects (Recommended)

Sorted by Caucus, Subregion, and Subbasin

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
Anadromous Fish Projects								
Subregion: Lower Columbia								
9104	Conduct Baseline Habitat and Pop. Dynamics Studies on Lampreys in Cedar Cr.	Lewis	USFWS, CRFPO	232,145	151,000	240,000	250,000	Drop mark/recapture (obj. 3a & 4) and keep spawning characteristics and capping redds
9105	Determine if Salmon are Successfully Spawning Below Lower Columbia MS Dams	Lower Columbia Mainstem	WDFW, ODFW	168,324	200,269	194,841	204,583	Incorporates 9131
9306000	Evaluate Columbia River Select Area Fisheries	Lower Columbia Mainstem	ODFW, WDFW	1,500,000	1,400,000	1,500,000	1,500,000	Clifton site capitalization costs of $100,000 are deferred for future consideration
8612400	Inspection Service For Little Fall Creek Passage	Willamette	ODFW	23,475	23,475	2,000	2,000	Fund as proposed - major reduction after FY99 for maintenance only
8816000	Willamette Hatchery Oxygen Supplementation	Willamette	ODFW	42,731	42,731	26,806	0	
9607000	McKenzie River Focus Watershed Coordination	Willamette		105,000	105,000	95,000	85,000	
Subregion: Lower Mid-Columbia								
9005	Irrigation System Replacement Trout Cr. @ Willowdale II 1999 Funds	Deschutes	JCSWCD	28,750	28,750	0	0	Include 9003, 9004, & 9006
9007	Jefferson Co./Middle Deschutes Watershed Coordinator/Council Support 1999	Deschutes	JCSWCD	30,775	23,300	0	0	Coordinator Wages, $15,620; benefits, $4,100; travel, $580; clerical/council support, $3,000.
9133	Bakeoven Riparian Assessment	Deschutes		35,065	35,065	60,000	110,000	
9138	Warm Springs Reservation 1999 Watershed	Deschutes	CTWSRO	356,119	320,000	0	0	

* Applies to FY99 Recommended budget

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
	Enhancement Project							
9404200	Trout Creek Habitat Restoration Project	Deschutes	ODFW	335,800	298,000	333,900	339,934	Reduction due to elimination of enforcement task
9087	Acquire 1860 Fifteenmile Cr irrigation water right and convert to instream		Fifteenmile	OWT	19,630	19,630	1,000	0
9146	Evaluate Effects of Habitat Work Conducted in Fifteenmile Creek	Fifteenmile	ODFW	96,632	23,000	97,000	102,000	Adult monitoring reduced and screw trap not needed
9304000	Fifteenmile Creek Habitat Restoration Project	Fifteenmile	ODFW	220,000	220,000	220,000	220,000	
9126	Hood River Fish Habitat Project	Hood	CTWSRO	117,088	117,088	200,000	200,000	
8805303	Hood River Production Program (HRPP)	Hood	CTWSRO	555,318	500,000	580,000	605,000	Reduced for watershed coordination cost sharing
8805304	Monitor Actions Implemented Under the Hood River Production Program.	Hood	ODFW	412,224	412,224	424,000	437,000	
8902900	Hood River Production Program - Pelton Ladder - Hatchery	Hood	ODFW	132,467	132,467	141,739	151,660	
9301900	Hood River Production Program - Oak Springs, Powerdale, Parkdale O&M	Hood	CTWSRO	467,567	467,567	398,000	411,000	
9500700	Hood River Production Program - PGE: O&M	Hood	PGE	95,000	95,000	90,000	85,000	
9012	Mitigate Effects of Runoff & Erosion on Salmonid Habitat in Pine Hollow	John Day	Sherman SWCD	26,960	26,960	0	0	
9045	Eliminate Gravel Push-Up Dams on Lower North Fork John Day		John Day	NFJDWC	66,500	66,500	70,000	70,000
9137	John Day Watershed Restoration	John Day	CTWSRO	215,756	215,000	0	0	
9139	Acquisition of Pine Creek Ranch	John Day	CTWSRO	1,200,000	1,200,000	0	0	
9144	Monitor Natural Escapement & Productivity of John Day Basin Spring Chinook	John Day	ODFW	125,400	125,400	131,900	138,500	
8402100	Protect and Enhance John Day River Fish Habitat	John Day	ODFW	380,000	380,000	395,000	410,000	
9303800	North Fork John Day Area Riparian Fencing	John Day	USFS	68,000	58,000	68,000	68,000	
9306600	Oregon Fish Screening Project FY99 Proposal	John Day	ODFW	522,853	522,853	540,000	560,000	
9605300	North Fork John Day River Dredge Tailings Restoration	John Day	USFS/CTUIR	85,000	75,000	85,000	85,000	Decrease due to lack of agreement on the "bog" task

* Applies to FY99 Recommended budget

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9703400	Monitor Fine Sediment and Overwinter Sedimentation in John Day & Gr Ronde	John Day	CRITFC	30,066	30,066	31,500	33,070	
9506800	Klickitat Passage/Habitat Improvement M&E	Klickitat	YIN	573,979	548,979	925,000	925,000	
9705600	Lower Klickitat River Riparian & In-Channel Habitat Enhancement Project		Klickitat	YIN	295,683	295,683	350,000	350,000
9202200	Physiological Assessment of Wild and Hatchery Juvenile Salmonids	Lower Mid-Columbia Mainstem	NMFS	349,099	349,099	355,000	358,000	
9406900	A Spawning Habitat Model to Aid Recovery Plans for Snake River Fall Chinook	Lower Mid-Columbia Mainstem	PNNL	325,000	165,000	325,000	100,000	Fund at FY98 level and defer expansion into the Snake River, or fund the Snake River work and not the Columbia River portion
9603201	Begin Implementation of Year 1 of the K Pool Master Plan Program	Lower Mid-Columbia Mainstem	YIN	845,400	283,320	1,300,000	1,400,000	RFM recommends sturgeon tasks be assigned to Tier 2; AFM recommends funding lamprey objectives
9092	Umatilla Tribal Fish and Wildlife Enforcement	Umatilla	CTUIR	246,505	246,505	258,830	271,776	Enforcement
8343600	Umatilla Passage O&M	Umatilla	USBR	400,000	400,000	400,000	400,000	Added pending NPPC/BPA approval; need proposal
8710001	Enhance Umatilla River Basin Anadromous Fish Habitat	Umatilla	CTUIR	295,000	270,000	305,000	315,000	Slight reduction due to overall increased effeciencies
8710002	Protect & Enhance Coldwater Fish Habitat in the Umatilla River Basin	Umatilla	ODFW	320,560	481,000	280,000	295,000	Increase due to availability of increased FEMA funding
8802200	Trap and Haul in the Umatilla and Walla Walla Basins	Umatilla	CTUIR	509,000	420,000	535,000	560,000	Reduction justification forthcoming
8902401	Evaluate Juvenile Salmonid Outmigration and Survival in the Lower Umatilla	Umatilla	ODFW	175,710	240,000	0	0	Funding increase described in the proposal revision

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
8902700	Power/Repay O&M For USBR CPR Pumping Project		Umatilla	PPL/UECA	500,000	500,000	500,000	500,000 Added pending NPPC/BPA approval; Need proposal
8903500	Umatilla Hatchery Operation and Maintenance	Umatilla	ODFW	822,709	797,000	880,000	942,000	Hold at FY98 funding due to budget constraints
9000500	Umatilla Hatchery Monitoring and Evaluation	Umatilla	ODFW	615,586	615,586	653,074	672,666	
9000501	Umatilla and Walla Walla Basin Natural Production M&E Project	Umatilla	CTUIR	700,516	610,516	646,000	678,000	Reduced from proposal for budget effeciencies
9010	Assess Fish Habitat & Salmonids in Walla Walla Watershed in Washington	Walla Walla	WDFW	183,792	183,792	179,234	159,000	
8343500	Operate and Maintain Umatilla Hatchery Satellite Facilities	Walla Walla	CTUIR	785,441	735,441	1,287,000	1,341,000	
8805302	Plan, Site, Design & Construct NEOH Hatchery-Umatilla/Walla Walla Component	Walla Walla	CTUIR	6,400,000	400,000	2,000,000	0	Defer construction until 3-step NPPC process completed
9601100	Screens and Traps on the Walla Walla and Touchet	Walla Walla	CTUIR	1,400,000	2,600,000	750,000	0	Increase due to deferral of work in FY98
9601200	Adult Fish Passage Improvement - Walla Walla River	Walla Walla	CTUIR	400,000	400,000	0	0	
9604601	Walla Walla Basin Fish Habitat Enhancement	Walla Walla	CTUIR	240,000	230,000	255,000	270,000	Slight decrease from increased efficiencies
9154	Wind River Ecosystem Restoration	Wind	UCD	669,149	350,000	620,130	652,224	Hold at FY98 funding level for now
9067	Coordinate/Facilitate Watershed Project Planning/Implementation	Yakima	YRWC	193,100	75,000	100,000	100,000	Reduce FTE funding with cost share
9100	Reestablish Safe Access into Tributaries of the Yakima Subbasin	Yakima	YIN, WDFW	396,801	100,000	1,583,000	1,583,000	Reduction due to cost sharing with WDFW
9101	Restore Upper Toppenish Creek Watershed	Yakima	YIN	225,075	100,000	371,997	444,629	Fund only the completion of the assessment for now
9102	Ahtanum Creek Watershed Assessment	Yakima	YIN	289,990	150,000	500,000	750,000	Fund only the assessment for now
8506200	Evaluate the Effectiveness of Fish Screens	Yakima	PNNL	299,999	100,000	100,000	100,000	Do not need the extensive monitoring every year -

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
								need sponsor to increase effectiveness
8811500	Yakima Hatchery Construction	Yakima	YIN - YFP	3,000,000	3,000,000	0	0	Fund as proposed - ends after FY99
8812001	Yakima/Klickitat Fisheries Project Management	Yakima	YIN - YKFP	750,000	750,000	750,000	750,000	
8812005	Video Fish Monitoring Project	Yakima	YIN	180,000	180,000	160,000	170,000	
8812008	Fisheries Technician Field Activities	Yakima	YIN	1,010,247	1,010,247	1,010,247	1,010,247	
9105500	Supplementation Fish Quality (Yakima)	Yakima	NMFS	500,000	500,000	500,000	500,000	
9105700	Yakima Phase 2 Screen Fabrication	Yakima	WDFW, YSS	186,000	186,000	300,000	150,000	
9107500	Yakima Phase II Screens - Construction	Yakima	USBR	1,500,000	1,500,000	1,000,000	1,000,000	
9200900	Yakima Screens - Phase II - O & M	Yakima	WDFW, YSS	156,100	156,100	130,000	140,000	
9405900	Yakima Basin Environmental Education	Yakima	ESD 105	119,416	119,416	119,416	123,000	
9503300	O&M of Yakima Fish Protection, Mitigation & Enhancement Facilities	Yakima	USBR	220,000	220,000	230,000	240,000	
9506300	Yakima/Klickitat Monitoring and Evaluation Program		Yakima	YIN	1,403,902	1,403,902	892,900	827,900
9506402	Upper Yakima Species Interactions Studies	Yakima	WDFW	400,000	400,000	400,000	400,000	
9506404	Policy/Technical Involvement & Planning for YKFP	Yakima	WDFW	275,000	275,000	275,000	275,000	
9506406	Monitor Supplementation Response Variable For the YKFP	Yakima	WDFW	200,000	200,000	200,000	200,000	
9603301	Supplement and Enhance the Two Existing Stocks of Yakima R. Fall Chinook	Yakima	YIN	1,053,604	953,604	1,080,000	1,145,000	Cost savings from increased efficiencies
9603302	Evaluate the Feasibillity and Potential Risks of Restoring Yakima R. Coho	Yakima	YIN	810,000	500,000	1,650,000	1,750,000	
9603501	Satus Watershed Restoration	Yakima	YIN	589,892	500,000	539,423	449,520	Slight reduction from increased efficiencies
9701300	Operation & Maintenance For Upper Yakima River Supplementation Facility	Yakima	YIN	1,457,296	1,455,000	1,530,161	1,606,669	
9704900	Teanaway River Instream Flow Restoration	Yakima	YIN	775,000	700,000	0	0	Slight reduction from increased efficiencies

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9705100	Yakima Basin Side Channels	Yakima	YIN	1,000,000	1,000,000	1,000,000	1,000,000	
9706200	Development /Refinement of Natural Production Objectives & Strategies	Yakima	YIN	67,000	67,000	67,000	67,000	
Subregion: Upper Mid-Columbia								
9604000	Evaluate the Feasibility and Risks of Coho Reintroduction in Mid-Columbia	Methow	YIN	1,370,000	700,000	2,690,000	3,040,000	Reduction due to increased efficiencies
9604200	Restore and Enhance Anadromous Fisheries and Habitat in Salmon Creek	Okanogan	CCT	250,000	175,000	150,000	150,000	One task eliminated
9044	Replace Chumstick Creek Culvert	Wenatchee	WDFW	171,380	171,380	0	0	
Subregion: Lower Snake								
9401805	Enhance Habitat For Spring Chinook, Summer Steelhead, and Bulltrout	Asotin	ACCD	193,000	239,000	270,000	280,000	Absorbs part of 9202602
9011	Characterize & Quantify Residual Steelhead in Clearwater River, Idaho	Clearwater	USFWS	133,300	133,300	80,700	80,700	
9057	Evaluate Status of Pacific Lamprey in the Clearwater River Drainage, Idaho	Clearwater	IDFG	72,295	72,295	73,500	77,000	
9059	Restore Anadromous Fish Habitat in the Little Canyon Creek Subwatershed	Clearwater	CFWP-ISCC	196,654	196,654	155,000	155,000	
9060	Restore Anadromous Fish Habitat in the Nichols Canyon Subwatershed	Clearwater	CFWP-ISCC	181,755	181,755	150,000	150,000	
9120	Protecting and Restoring Big Canyon Creek Watershed	Clearwater	NPT	441,459	162,000	250,000	100,000	Half of budget deferred due to budget constraints
9122	Rehabilitate Lapwai Creek	Clearwater	NPT	477,272	150,000	300,000	180,000	Half of budget deferred due to budget constraints
8335000	Nez Perce Tribal Hatchery	Clearwater	NPT	7,918,036	7,918,036	8,000,000	6,000,000	
9202409	Enhance Law Enforcement for Fish & Wildlife and Watersheds of the Nez Perce	Clearwater	NPT	425,236	425,236	400,000	400,000	Enforcement
9303501	Enhance Fish, Riparian and Wildlife Habitat within the Red River Watershed	Clearwater	ISWCD	589,960	500,000	580,000	570,000	Slight reduction for increased efficiencies
9403400	Assessing Summer & Fall Chinook Salmon Restoration in Snake River Basin	Clearwater	NPT	304,800	304,800	313,944	323,362	
9607702	Protecting and Restoring the Lolo Creek Watershed	Clearwater	NPT	361,062	361,062	397,168	59,575	

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9607703	Protecting and Restoring the Squaw and Papoose Creek Watersheds	Clearwater	NPT	241,693	241,693	265,862	39,879	
9607704	Final Design for Fish Passage Improvements at Lower Eldorado Falls	Clearwater	NPT	17,802	17,802	45,000	55,000	
9607705	Restore Mccomas Meadows	Clearwater	NPT	123,553	123,553	50,000	50,000	
9608600	Clearwater Subbasin Focus Watershed Program	Clearwater	ISCC	85,212	85,212	90,000	95,000	
9706000	Clearwater Subbasin Focus Watershed Program	Clearwater	NPT	93,024	93,024	98,000	103,000	WAG's
9150	Captive Broodstock Artificial Propagation	Grande Ronde	NPT	126,274		134,000	137,000	See 9801001
8402500	Protect and Enhance Fish Habitat in Grande Ronde Basin Streams	Grande Ronde	ODFW	280,264	260,000	295,000	310,000	Slight reduction due to budget constraints
8805301	Northeast Oregon Hatchery Master Plan	Grande Ronde	NPT	2,372,469	2,300,000	4,000,000	3,000,000	$2M for construction
8805305	NE Oregon Hatchery Master Plan and Facilities - ODFW	Grande Ronde	ODFW	287,200	215,000	240,000	250,000	Reduce time for review and planning (obj.2 and 6)
8909600	Monitor, Evaluate Genetic Characteristics of Supplemented Salmon & Steelhea	Grande Ronde	NMFS	249,500	225,000	250,000	250,000	The proposed budget reduction proportionally reduces information from this study
9202601	Grande Ronde Model Watershed - Project Planning Support	Grande Ronde	GRMWP	292,400	266,000	295,000	295,000	
9402700	Grande Ronde Model Watershed Habitat Projects	Grande Ronde	GRMWP	950,000	850,000	800,000	800,000	Some implementation deferred due to budget constraints
9403900	Wallowa Basin Project Planning	Grande Ronde	NPT	55,313	55,313	58,224	61,289	
9608300	Upper Grande Ronde Habitat Enhancement	Grande Ronde	CTUIR	200,000	180,000	250,000	250,000	Was 9128
9702500	Implement the Wallowa County/Nez Perce Tribe Salmon Recovery Plan	Grande Ronde	NPT	50,000	40,000	50,000	50,000	Slight reduction from increased efficiencies
9800702	Grande Ronde Supplementation - O&M/M&E - Nez Perce Tribe Lostine	Grande Ronde	NPT	382,124	327,124	439,000	483,000	Slight reduction from increased efficiencies
9800703	Conduct Satellite Facility O&M and Program M&E for Grande Ronde Spr Chinook	Grande Ronde	CTUIR	335,010	323,010	494,000	521,000	
9801001	Grande Ronde Basin Spring Chinook Captive Broodstock Program	Grande Ronde	ODFW/NPT	503,000	493,000	518,090	533,633	Slight reduction from increased efficiencies
9801006	Captive Broodstock Artificial Propagation	Grande Ronde	NPT	126,274	67,000	134,000	137,000	A $30,000 reduction by

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
								hiring one project leader for captive brood M&E and conventional hatchery production M&E
8712703	Imnaha River Smolt Monitoring Program Project	Imnaha	NPT	175,252	175,252	199,000	188,000	
9102800	Monitoring Smolt Migration of Wild Snake River Spring/Summer Chinook	Lower Snake Mainstem	NMFS	457,500	275,000	325,000	325,000	Carry forward will make up the reduction
9801003	Monitor and Evaluate the Spawning Distribution of Snake River Fall Chinook	Lower Snake Mainstem	USFWS	125,518	125,518	126,046	119,240	
9801004	Monitor and Evaluate Yearling Snake R Fall Chinook Upstream of Lwr Granite	Lower Snake Mainstem	NPT	301,039	301,039	260,000	265,000	
9801005	Pittsburg Landing, Capt. John Rapids, Big Canyon Fall Chinook Acclim. Fac.	Lower Snake Mainstem	NPT	724,000	624,000	767,000	813,000	Reduction due to no need to relace pump
9009	Restore Salmon River (Challis, ID) Area to Healthy Condition	Salmon	USFWS, IFRO	100,000	100,000	50,000	50,000	
9064	Analyze the Persistence and Spatial Dynamics of Snake River Chinook Salmon	Salmon	RMRS	101,590	50,000	103,700	105,800	Reduce by 50% for cost sharing to alleviate in-lieu concerns. Keep spawning ground survey objective; separate out micro-habitat work
9107100	Snake River Sockeye Salmon Habitat and Limnological Research	Salmon	SBT	405,173	405,173	425,000	430,000	
9107200	Redfish Lake Sockeye Salmon Captive Broodstock Program	Salmon	IDFG	680,097	680,097	680,000	680,000	
9202408	Protect Critical Salmonid Habitat and Habitat Restoration Investments	Salmon	SBT	193,980	193,980	203,132	213,289	Enforcement
9202603	Idaho Model Watersheds Admin./Impl. Support	Salmon	ISCC	175,000	175,000	175,000	175,000	
9204000	Redfish Lake Sockeye Salmon Captive Broodstock Rearing and Research	Salmon	NMFS	500,000	500,000	500,000	500,000	
9306200	Salmon River Anadromous Fish Passage Enhancement	Salmon	SWCD	100,000	100,000	100,000	100,000	
9401500	Idaho Fish Screening Improvement - O&M	Salmon	IDFG	1,000,000	1,000,000	1,000,000	1,000,000	

* Applies to FY99 Recommended budget

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9401700	Idaho Model Watershed Habitat Projects	Salmon	SWCD	400,000	400,000	400,000	350,000	
9405000	Salmon River Habitat Enhancement	Salmon	SBT	257,000	257,000	265,000	278,000	
9600700	Irrigation Diversion Consolidations & Water Conservation, Up. Salmon R., ID	Salmon	CS&WCD	446,250	446,250	446,250	1,000,000	
9604300	Johnson Creek Artificial Propagation Enhancement - O&M and M&E	Salmon	NPT	1,300,000	1,300,000	700,000	700,000	
9606700	Manchester Spring Chinook Broodstock Project	Salmon	NMFS	450,000	450,000	500,000	500,000	
9700100	Captive Rearing Initiative for Salmon River Chinook Salmon	Salmon	IDFG	144,989	144,989	145,000	145,000	
9703000	Monitor Listed Stock Adult Chinook Salmon Escapement	Salmon	NPT	160,000	160,000	160,000	162,000	
9703800	Listed Stock Chinook Salmon Gamete Preservation	Salmon	NPT	160,823	160,823	178,000	180,000	
9705700	Salmon River Production Program	Salmon	SBT	220,300	220,300	1,200,000	250,000	
9801002	Captive Rearing Initiative for Salmon River Chinook Salmon - M & E	Salmon	IDFG	88,664	88,664	83,000	84,000	
8909800	Salmon Supplementation Studies in Idaho Rivers	Salmon, Clearwater	IDFG	906,499	906,499	860,000	890,000	
8909801	Salmon Supplementation Studies in Idaho Rivers	Salmon, Clearwater	USFWS	147,345	147,344	150,000	150,000	
8909802	Salmon Supplementation Studies in Idaho Rivers	Salmon, Clearwater	NPT	339,335	339,335	335,000	335,000	
8909803	Salmon Supplementation Studies in Idaho Rivers	Salmon, Clearwater	SBT	226,270	226,270	190,000	195,000	
9005500	Steelhead Supplementation Studies in Idaho Rivers	Salmon, Clearwater	IDFG	258,200	258,200	258,000	268,000	
9107300	Idaho Natural Production Monitoring and Evaluation Program (INPMEP)	Salmon, Clearwater	IDFG	731,659	731,659	759,159	797,117	
9202602	Implement Eastern Washington Model Watershed Plans	Tucannon	WCC	159,466		166,194	169,673	See 9401805, 06, 07
9401806	Enhance Habitat For Spring & Fall Chinook, Summer Steelhead and Bulltrout	Tucannon	CCD	1,300,000	253,000	330,000	330,000	Absorbs part of 9202602
9401807	Enhance Habitat For Fall Chinook, Steelhead and Bulltrout	Tucannon	PCD	213,000	180,000	223,000	233,000	.
Subregion: Mainstem								
9117	Facilitation Services for the Regional Forum	Mainstem	NMFS	250,000	200,000	206,000	212,000	Allocation of facilitator time to priority needs
8332300	Monitor Smolts at the Head of Lower Granite Reservoir and Lower Granite Dam	Mainstem	IDFG	415,700	382,000	436,500	458,300	

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
8401400	Smolt Monitoring at Federal Dams	Mainstem	NMFS	668,000	668,000	670,000	675,000	
8712700	Smolt Monitoring By Non-Federal Agencies	Mainstem	PSMFC	1,262,421	1,262,421	1,325,542	1,391,819	
8712702	Comparative Survival Rate Study (CSS) of Hatchery Pit Tagged Chinook	Mainstem	PSMFC	1,216,369	1,216,369	1,277,187	1,341,046	
8740100	Assess Smolt Condition for Travel Time Analysis: Physiology,Health Survival	Mainstem	USGS	231,150	199,000	0	0	
8910700	Statistical Support for Salmonid Survival Studies	Mainstem	UW	183,300	180,000	187,000	192,000	Hold at FY98 funding
9007700	Northern Squawfish Management Program	Mainstem	PSMFC	3,628,017	3,306,000	3,651,918	3,834,513	
9008000	Columbia Basin Pit-Tag Information System	Mainstem	PSMFC	1,041,221	1,041,221	1,103,694	1,169,916	
9009300	Life History and Genetic Analysis of Oncorhynchus nerka	Mainstem	UI	139,434	139,434	70,000	70,000	
9102900	Life History and Survival of Fall Chinook Salmon in Columbia River Basin	Mainstem	USGS	900,000	900,000	800,000	700,000	
9202401	Enhanced Harvest & Habitat Law Enforcement for Anadromous Salmonids & Resid	Mainstem	CRITFC	876,054	876,054	919,856	965,848	Enforcement
9204101	Evaluate Adult Migration in Lwr Col. River and Tributaries	Mainstem	COE	375,000	200,000	375,000	0	Hold at FY98 funding - proposal did not indicate a significant change in scope
9300802	Symptoms of GBT Induced in Salmon by TDGS of the Columbia and Snake Rivers	Mainstem	CRITFC	649,677	272,566	0	0	Sub-contract to CRRL for hydroacoustic work was removed from original budget request.
9302900	Survival Estimates for Passage of Juvenile Salmonids Through Dams & Res.	Mainstem	NMFS	1,081,000	1,081,000	1,200,000	1,200,000	
9602100	Gas Bubble Disease Research & Monitoring of Juvenile Salmonids	Mainstem	USGS	914,545	652,000	0	0	Complete depth tag studies - last year of funding
9701000	PIT Tag System Transition	Mainstem	BPA	800,000	800,000	500,000	0	
9701400	Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach	Mainstem	WDFW	384,000	384,000	50,000	10,000	
9702400	Avian Predation on Juvenile Salmonids in the Lower Columbia R: Phase II M&E	Mainstem	OSU, CRITFC	350,000	280,000	350,000	200,000	The budget recommendation will necessitate changes in the FY99 work, and either the

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
								radio-telemetry study of tern and cormorant foraging behavior in the estuary (new component) or addressing avian predation above Bonneville Dam will need to be eliminated.
9063	Ocean Survival of Salmonids Relative to Migrational Timing, Fish Health…	Ocean/estuary	NMFS/NW FSC	788,200	0	0	800,000	The AFM recommend funding this project at $300K from the ESA Reserve Account through FY00; therefore the CBFWA recommendation for Direct Program Funding is $0.00
9702600	Identify Marine Fish Predators of Salmon and Estimate Predation Rates	Ocean/estuary	NMFS	200,600	0	0	200,000	The AFM recommend funding this project at $200K from the ESA reserve account through FY00; therefore, the CBFWA recommendation for Direct Program Funding is $0.00.
Subregion: Systemwide								
9131	Evaluate Fall Chinook & Chum Spawning, Production & Habitat Use in Col R	Systemwide	WDFW	55,945		58,742	61,679	Budget incorporated into 9105
9132	Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Watershed Restoration Plan Now	Systemwide	CRITFC	121,385	121,385	125,000	150,000	
8201300	Coded-Wire Tag Recovery Program	Systemwide	PSMFC	1,731,440	1,731,440	1,818,012	1,908,913	
8331900	New Fish-Tagging System	Systemwide	NMFS	1,202,400	1,202,400	1,450,000	1,450,000	
8810804	Streamnet: The Northwest Aquatic Information Network	Systemwide	PSMFC	1,970,000	1,800,000	2,007,430	2,067,653	Increase $100K from FY98 for watershed coordination database work

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
8906200	Prepare Draft Annual Implementation Work Plan	Systemwide	CBFWA	1,269,457	1,769,457	1,307,541	1,346,767	$500K increase from Reserve for Member participation in regional coordination (Volume I, Section IV).
8906500	Annual Fish Marking - Missing Hatchery Production Groups	Systemwide	USFWS	399,460	399,460	552,195	607,414	The FY 99 budget request is in error and should be $501,995. If funded at $399k, the PIT tags ($73,950) will ned to be purchased from another account, spring chinook at Entiat NFH ($29,600) will not be marked.
8906600	Annual Coded Wire Tag Program-Missing Production WA HTCH (WDF)	Systemwide	WDFW	358,736	335,000	383,848	410,717	Added pending NPPC/BPA approval
8906900	Annual Coded Wire Tag Program - Missing Production OR Htc (ODFW)	Systemwide	ODFW	190,000	190,000	200,000	200,000	
9005200	Performance/Stock Productivity Impacts of Hatchery Supplementation	Systemwide	USGS	496,493	460,000	430,000	335,000	The funding difference will be accommodated by reduced work load.
9007800	Evaluate Predator Control and Provide Technical Support For PATH	Systemwide	USGS	54,723	40,000	40,000	40,000	Low participation
9202604	Spring Chinook Salmon Early Life History	Systemwide	ODFW	687,380	650,000	708,001	729,241	Reduction from increased effeciencies
9203200	Life-Cycle Model Development and Application to System Planning	Systemwide	USFS	117,181	70,000	120,000	72,000	Low participation
9303701	Technical Assitance With Life Cycle Modeling	Systemwide	PER Ltd.	175,000	70,000	180,000	185,000	3/4 FTE
9305600	Assessment of Captive Broodstock Technology	Systemwide	NMFS	1,200,000	1,200,000	1,200,000	1,200,000	
9402600	Pacific Lamprey Research and Restoration	Systemwide	CTUIR	388,000	320,000	408,000	430,000	Maintain at FY98 funding
9403300	The Fish Passage Center	Systemwide	PSMFC	1,060,381	1,060,381	1,113,400	1,169,070	
9600500	Operate Independent Scientific Advisory Board	Systemwide	CBFWF	663,705	663,705	683,616	704,124	
9600600	Path-Facilitation, Technical Assistance, and Peer Review	Systemwide	ESSA	450,000	450,000	400,000	350,000	

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9600800	PATH-Participation by State and Tribal Agencies	Systemwide	ODFW	698,137	698,137	698,200	698,200	
9600801	Provide Scientific Input to the PATH Process	Systemwide	NMFS	75,000	75,000	75,000	75,000	
9601700	Provide Technical Support in the Plan For Analyzing and Testing Hypotheses	Systemwide		108,887	27,221	110,000	110,000	1/4 FTE
9700200	PATH-UW Technical Support	Systemwide	UW	302,289	182,389	300,000	300,000	Incl $50K 9098 & reduced $119.9K see 9800100
9800100	Analytical Support-PATH and ESA Biological Assessments	Systemwide	HES	119,900	119,900	105,000	110,000	
9808001	PIT Tag Purchase and Distribution	Systemwide	PSMFC	0		0	0	
		Anadromous Fish total:		**104,863,053**	**90,942,116**	**95,394,749**	**90,138,155**	

Resident Fish Projects

Subregion: Lower Columbia

9405300	Bull Trout Assessment - Willamette/Mckenzie	Willamette	ODFW	46,008	46,008	47,390	48,810	

Subregion: Lower Mid-Columbia

9405400	Bull Trout Genetics, Habitat Needs, L.H. Etc. in Central and N.E. Oregon	Deschutes, John Day, Grande Ronde, Umatilla...	ODFW	339,517	339,517	330,000	280,000	
8605000	White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers	Lower Mid-Columbia Mainstem	ODFW	2,900,000	1,960,000	2,200,000	2,200,000	Transfer genetics tasks to 9084, defer hatchery supplementation, use indexing instead of extensive stock assessments, budget no longer includes NPT sturgeon work
9033	Document Native Trout Populations	Wind, Little White Salmon, Klickitat	WT	52,300	52,300	53,000	54,000	
9095	Bull Trout Population Assessment in the Columbia River Gorge, WA	Wind, Little White Salmon, Klickitat	WDFW	150,000	150,000	200,000	200,000	

Subregion: Upper Mid-Columbia

9502800	Restore Moses Lake Recreational Fishery	Crab	WDFW	269,438	269,438	158,000	214,000	

* Applies to FY99 Recommended budget

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
Subregion: Upper Columbia								
9004400	Implement Fisheries Enhancement Opportunities :Coeur d'Alene Reservation	Coeur d'Alene	CDA Tribe	1,858,874	858,874	1,894,000	894,000	$1,000,000 for hatchery deferred to 2000
9101901	Hungry Horse Fisheries Mitigation Plan Flathead Lake	Flathead	CSKT	65,000	65,000	65,000	65,000	
9101903	Hungry Horse Dam Mitigation - Watershed Restoration and Monitoring	Flathead	MFWP	474,255	474,255	490,000	500,000	
9101904	Hungry Horse Mitigation - Hatchery-Based Impl. of Native Fish Recovery	Flathead	USFWS	484,000	389,400	484,000	484,000	Budget reduced to reflect the transition from the kokanee test to a focus on native species
9401002	Mitigation for Excessive Drawdowns: Hungry Horse Component	Flathead	MFWP, CSKT	248,435	248,435	250,000	250,000	
9502500	Flathead River Instream Flow Project	Flathead	MFWP	100,000	100,000	100,000	33,000	
9608701	Focus Watershed Coordination-Flathead River Watershed	Flathead	CSKT, MFWP	100,000	100,000	100,000	100,000	
8346700	Mitigation for the Construction and Operation of Libby Dam	Kootenai	MFWP	500,000	500,000	600,000	600,000	
8806400	Kootenai River White Sturgeon Studies and Conservation Aquaculture	Kootenai	KTOI	1,281,092	1,281,092	2,782,000	1,942,250	Includes 50,000 from 9401200
8806500	Kootenai River Fisheries Investigations	Kootenai	IDFG	579,299	604,299	608,264	638,677	Includes 50,000 from 9401200
9401001	Mitigation for Excessive Drawdowns at Hungry Horse & Libby Reservoirs - Lib	Kootenai	MFWP, CSKT	474,405	374,405	380,000	300,000	Original 99 request came from a 4 year budget plan, the new budget was adjusted to reflect current actions
9401200	Kootenai River Fisheries Investigation M&E Supplemental Budget	Kootenai	IDFG, KTOI	100,000	0	0	0	Funding shifted to 8806400 and 8806500
9404900	Improve the Kootenai River Ecosytem	Kootenai	KTOI	245,598	245,598	250,000	275,000	
9608720	Focus Watershed Coordination-Kootenai River Watershed	Kootenai	MFWP, CSKT	99,547	99,547	100,000	100,000	

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
8346500	Libby and Hungry Horse Modeling Technical Analysis	Kootenai, Flathead	MFWP	25,176	20,000	25,000	25,000	Includes carry forward dollars
9404700	Lake Pend Oreille Fishery Recovery Project	Pend Oreille	IDFG	361,000	361,000	365,000	379,000	
9500100	Kalispel Tribe Resident Fish	Pend Oreille	KNRD	286,000	286,000	297,000	303,000	
9700300	Box Canyon Watershed Project	Pend Oreille	KNRD	70,809	70,809	72,000	74,900	
9700400	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	Pend Oreille, Spokane, Upper Columbia Mainstem	KNRD	405,007	405,000	421,000	438,000	
9094	Produce Kokanee Salmon in Net Pens for Release into Lake Roosevelt	Upper Columbia Mainstem	STOI	175,000	0	35,000	35,000	FY99 request withdrawn by sponsor
8503800	Colville Hatchery	Upper Columbia Mainstem	CCT	360,426	360,426	360,426	365,000	
9001800	Evaluate Rainbow Trout Habitat/Passage Improvements of Tribs. to L. Roosev	Upper Columbia Mainstem	CCT	168,000	168,000	182,000	0	
9104600	Spokane Tribal (Galbraith Springs) Hatchery O&M	Upper Columbia Mainstem	STOI	453,000	453,000	475,000	498,000	
9104700	Sherman Creek Hatchery O&M	Upper Columbia Mainstem	WDFW	319,486	319,486	174,571	179,808	
9404300	Monitor, Evaluate, and Research the Lake Roosevelt Fishery	Upper Columbia Mainstem	STOI	1,500,000	1,400,000	1,500,000	1,500,000	Tasks deferred to 2000
9500900	Volunteers Rear 500,000 Net Pen Rainbow Trout Above Grand Coulee Dam	Upper Columbia Mainstem	LRDA	99,775	99,775	96,000	98,000	
9501100	Chief Joseph Kokanee Enhancement Project	Upper Columbia Mainstem	CCT	600,000	600,000	600,000	600,000	
Subregion: Lower Snake								
8709900	Dworshak Dam Impacts Assessment and Fisheries Investigation	Clearwater	IDFG	651,000	120,000	467,600	460,000	Light array task deferred
8740700	Dworshak Impacts/M&E & Biological-Integrated Rule Curves	Clearwater	NPT	250,000	200,000	250,000	400,000	
9501300	Nez Perce Trout Ponds	Clearwater	NPT	749,263	749,263	750,000	300,000	
9501600	Genetic Inventory of Westslope Cutthroat Trout, North Fork Clearwater Basin	Clearwater	NPT	290,000	190,000	350,000	400,000	Bull trout tasks deleted
9700900	Evaluate Means of Rebuilding White Sturgeon	Lower Snake	NPT	400,000	400,000	412,000	425,000	

* Applies to FY99 Recommended budget

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
	Populations in Lower Snake R	Mainstem						
Subregion: Upper Snake								
9107	North Fork Malheur River Bull Trout and Redband Trout Life History Study	Malheur	BPT	238,981	142,347	110,000	110,000	Costs redistributed over 3 years
9701900	Stinkingwater Salmonid Project	Malheur	BPT	199,785	199,785	200,000	200,000	
8815600	Stocking Fish in Lakes and Streams on the Duck Valley Indian Reservation	Owyhee	SPT	109,997	109,997	110,000	110,000	
9501500	Billy Shaw Wetlands catch and release fishery O&M	Owyhee	SBT	250,000	215,000	250,000	250,000	Deferred fish stocking task
9701100	Enhance and Protect Habitat and Riparian Areas on Duck Valley Reservation	Owyhee	SPT	293,000	293,000	293,000	293,000	
9201000	Habitat Restoration/Enhancement Fort Hall Reservation	Upper Snake	SBT	192,748	162,748	130,000	135,000	Some of the genetics tasks were deferred until 2000
9500600	Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility	Upper Snake	SBT	319,161	249,161	302,000	302,000	A full complement of personnel is not needed during the first year of operation
9106700	Idaho Water Rental: Resident Fish and Wildlife Impacts Phase III	Upper Snake, Boise, Payette	IDFG	119,000	110,000	120,000	120,000	Tasks deleted
9800200	Snake River Native Salmonid Assessment	Upper Snake, Boise, Payette, Weiser, Owyhee, Mid S	IDFG	250,000	225,000	250,000	250,000	
Subregion: Systemwide								
9084	Assessing Genetic Variation Among Columbia Basin White Sturgeon Populations	Systemwide	UI	137,736	137,736	148,000	152,000	
		Resident Fish total:		**19,642,118**	**16,205,701**	**19,837,251**	**17,581,445**	

Wildlife Projects

Subregion: Lower Columbia								
9705904	Securing Wildlife Mitigation Sites-Oregon, Horn Butte	Lower Columbia Mainstem	ODFW	1,000,000		15,000	15,000	Fund under 9705900
9705909	Securing Wildlife Mitigation Sites-Oregon, Mitchell Point	Lower Columbia Mainstem	ODFW	1,000		1,000	1,000	Fund under 9705900

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9061	River Wetlands Restoration and Evaluation Program	Sandy	USFS	125,000	125,000	125,500	0	
9062	Sandy River Delta Riparian Reforestation	Sandy	USFS	21,500	21,500	21,500	21,500	
9107800	Burlington Bottoms Wildlife Mitigation Project	Willamette	ODFW	115,030	58,000	62,000	65,000	Error in original project proposal. $58,000 is correct request
9205900	Amazon Basin/Eugene Wetlands Phase II	Willamette	TNC	50,000	50,000	50,000	50,000	
9206800	Implementation of Willamette Basin Mitigation Program--Wildlife	Willamette	ODFW	500,000	400,000	200,000	200,000	20% reduction in all tasks
9705906	Securing Wildlife Mitigation Sites-Oregon, McKenzie River Islands	Willamette	ODFW	250,000		15,000	25,000	Fund under 9705900
9705907	Securing Wildlife Mitigation Sites-Oregon, E.E. Wilson WMA Additions	Willamette	ODFW	200,000		15,000	10,000	Fund under 9705900
9705908	Securing Wildlife Mitigation Sites-Oregon, Multnomah Channel	Willamette	Metro	65,000		30,000	0	Fund under 9705900
9705916	Tualatin River National Wildlife Refuge Additions	Willamette	ODFW	1,000,000		1,350,000	1,425,000	Fund under 9705900
Subregion: Lower Mid-Columbia								
9705910	Securing Wildlife Mitigation Sites-Oregon, Trout Creek Canyon	Deschutes	ODFW	1,500,000		1,440,000	60,000	Fund under 9705900
9705913	Securing Wildlife Mitigation Sites-Oregon, South Fork Crooked River	Deschutes	ODFW	20,000		1,000	1,000	Fund under 9705900
9140	Acquisition of Pine Creek Ranch	John Day	CTWSRO	1,361,917		94,600	99,330	Fund under 9705900
9009200	Wanaket Wildlife Mitigation Project	Lower Mid-Columbia Mainstem	CTUIR	150,000	150,000	150,000	150,000	
9705915	Juniper Canyon and Columbia Gorge Wildlife Mitigation Project	Lower Mid-Columbia Mainstem	CTUIR	40,000		40,000	50,000	Delayed implementation, O&M funds unnecessary in FY98. FY99: Fund under 9705900
9506001	Enhance Squaw Creek Watershed for Anadromous Fish & Wildlife Habitat	Umatilla	CTUIR	210,000	200,000	200,000	200,000	Fence construction reduced by $10,000
9106100	WDFW Projects	Yakima	WDFW	0	233,300	0	0	Submitted to BPA as part of project 9609400.
9206200	Yakama Nation - Riparian/Wetlands Restoration	Yakima	YIN	1,750,000	1,600,000	1,750,000	1,750,000	8.6% reduction in activities

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
								across the board
Subregion: Upper Columbia								
9004401	Lake Creek Land Acquisition and Enhancement	Coeur d'Alene	CDA Tribe	212,402	186,083	200,000	200,000	Operations and maintenance budget reduced because acquisition is not completed
9106000	Kalispel Pend Oreille Wetlands Wildlife Mitigation Project	Pend Oreille	KT	139,049	115,557	156,000	162,000	Unspent 98 funds carried forward and applied to 99
9013	Hellsgate Big Game Winter Range Continuing Acquisition	Upper Columbia Mainstem	CCT	1,500,000	150,000	100,000	150,000	Scope of project acquisition reduced
9116	Rasor Ranch Acquisition/Crab Creek Watershed Restoration Project	Upper Columbia Mainstem	USFWS/C NWS	775,000	395,000	200,000	200,000	Need reduced by $330,000 because acquisition is moving forward in 98. $50,000 reduction in planned enhancements
9204800	Hellsgate Big Game Winter Range	Upper Columbia Mainstem	CCT	250,000	250,000	250,000	250,000	
9206100	Albeni Falls Wildlife Mitigation Project	Upper Columbia Mainstem	IDFG	800,000	700,000	800,000	810,000	Unspent FY98 funds should be adequate to fund all FY99 activities.
9506700	Coville Confederated Tribes Performance Contract (Credits For Habitat)	Upper Columbia Mainstem	CCT	100,000	100,000	100,000	100,000	
9705911	Securing Wildlife Mitigation Sites-Oregon, Irrigon WMA Additions	Upper Columbia Mainstem	ODFW	200,000		10,000	3,000	Fund under 9705900
9800300	O & M Funding of Wildlife Habitat on STOI Reservation for Grand Coulee Dam	Upper Columbia Mainstem	STOI	96,939	96,939	84,000	86,500	Was 9129 (changed 4/15 per BPA)
Subregion: Lower Snake								
9608000	Northeast Oregon Wildlife Mitigation Project	Grande Ronde	NPT	227,735	227,735	235,325	242,917	
9705905	Securing Wildlife Mitigation Sites-Oregon, Ladd Marsh WMA Additions	Grande Ronde	ODFW	8,000		5,000	5,000	Fund under 9705900

ID	Title	Subbasin	Sponsor	Solicited	Recommended	FY00	FY01	Notes*
9705912	Securing Wildlife Mitigation Sites-Oregon, Wenaha WMA Additions	Grande Ronde	ODFW	100,000		100,000	20,000	Fund under 9705900
Subregion: Upper Snake								
9106	Aquisition of Malheur Wildlife Mitigation Site	Malheur	BPT	2,406,310		100,500	100,500	Fund under 9705900. Project request is revised to $1,756,310 due to reduction in acquisition costs of $650,000.
9130	Burns Paiute Mitigation Coordinator	Malheur	BPT	45,281		47,000	48,500	Fund under 9705900
9505700	Southern Idaho Wildlife Mitigation	Upper Snake	IDFG	3,511,446	3,111,446	3,230,970	2,857,976	Reduction in scope of project acquisitions (approx. 150-250 acres)
Subregion: Systemwide								
9609400	Washington Department of Fish & Wildlife Habitat Units Acquisition	Systemwide	WDFW	3,325,600	3,130,100	2,380,820	2,663,700	$233,300 listed seperately under project 9106100. Additional $37,800 in adminstrative overhead not included in original project proposal.
9705900	Securing Wildlife Mitigation Sites - Oregon	Systemwide	ODFW, OWC, CTWSRO, CTUIR	4,000,000	4,000,000	5,000,000	6,000,000	Umbrella project encompassing projects 9106, 9130, 9140, 9705904-9705916
		Wildlife total:		**26,057,209**	**15,300,660**	**18,560,215**	**18,022,923**	

Table 4. FY99 Tier 2 Projects (Recommended When Funding Becomes Available)

Sorted by Caucus, Subregion and Subbasin

ID	Title	Subregion	Sponsor	Solicited*	FY00	FY01	Notes
Anadromous Fish Projects							
Subregion: Lower Columbia							
9019	Monitor Reproductive Physiology of Columbia River White Sturgeon	Lower Columbia Mainstem	OSU	103,882	107,859	113,391	
9149	Evaluate and Monitor Bacterial Cold Water Disease impacting salmonids	Lower Columbia Mainstem		83,900	52,000	52,000	Pending
9036	McKenzie Watershed Habitat Assessment and Project Prioritization	Willamette		147,000	0	0	Pending
9037	Acquire Fish and Wildlife Habitat in the McKenzie Watershed	Willamette		241,500	0	0	Pending
9038	Evaluate Spring Chinook Life History-habitat Relationships in the McKenzie	Willamette		182,250	143,589	146,104	Pending
Subregion: Lower Mid-Columbia							
9003	Restore/Enhance Trout Creek @ Ashwood Phase II	Deschutes	JCSWCD	56,800	0	0	See 9005
9004	Restore/Enhance Trout Creek @ Ashwood Phase I	Deschutes	JCSWCD	56,800	0	0	See 9005
9006	Restore/Enhance Trout Creek @ Willowdale	Deschutes	JCSWCD	83,400	0	0	See 9005
9153	Preserve Cryogenically the Gametes of Selected Mid-Columbia Salmonid stocks	Deschutes	CRITFC	89,573	89,573	75,000	Pending
9145	Evaluate the Status of Columbia River Sea-Run Cutthroat Trout	Hood, Wind	ODFW	264,964	311,888	274,024	Pending - need to compare proposal to work that might already have been completed
9001	Monitor Water Quality and Quantity in Eastern Klickitat County	Klickitat	EKCD	11,285	8,070	8,475	Should apply to DOE for funding
9002	Monitor Water Quality and Quantity in L. Klickitat R. and Its Tributaries	Klickitat	CKCD	16,800	11,720	12,305	Should apply to DOE for funding
9089	Classify Riparian and Wetland Vegetation in the Columbia	Lower Mid-Columbia	WDNR	59,421	28,221	48,867	Endnote 4

ID	Title	Subregion	Sponsor	Solicited*	FY00	FY01	Notes
	Basin of Wash.	Mainstem					
9159	Rock Creek Watershed Assessment and Restoration Project	Rock Creek	YIN	266,106	289,000	289,000	Fund at reduced level due to budget constraints
9032	Teach Adults to Become Holistic Master Watershed Stewards	Yakima	GCEE	81,791	84,245	86,772	Endnote(s) 1,4
9065	Little Naches Streambank Restoration	Yakima	USFS	24,240	0	0	Endnote 5
9068	Improve Stream Habitat Through Reduction in Farm Runoff	Yakima	BCD	1,925,000	0	0	Endnote(s) 5,7
9069	Enhance Upper Yakima River Basin Fish Habitat	Yakima	KCCD	500,000	5,500	5,500	Endnote(s) 5,7
9070	Improve Water Quality Through Sedimentation and Nutrient Reduction	Yakima	SYCD	200,000	0	0	Endnote(s) 5,7
9071	Improve Yakima River Water Quality	Yakima	RSBOJC	100,000	75,000	50,000	Endnote(s) 5,7
9072	Improve Return Flow Water Quality	Yakima	RSBOJC	105,000	1,700,000	1,700,000	Endnote(s) 5,7
9073	Improve Water Quality Monitoring Program	Yakima	RSBOJC	50,000	0	0	Endnote(s) 5,7
9074	Construct Sediment Settling Basins	Yakima	RSBOJC	300,000	0	0	Endnote(s) 5,7
9075	Construct Wetlands	Yakima	RSBOJC	100,000	50,000	0	Endnote(s) 5,7
9076	Evaluate Return Flow Recovery	Yakima	RSBOJC	50,000	0	0	Endnote(s) 5,7
9109	Acquisition of Water and Floodplain Fisheries Habitat in the Yakima Basin	Yakima	YIN	5,000,000	5,000,000	5,000,000	Endnote 7
9114	Stabilizing Stream Channels in the Cabin Creek Watershed	Yakima	USFS	86,000	60,000	50,000	Endnote(s) 4,5,7
9158	Little Naches River Riparian and In-Channel Habitat Enhancement Project	Yakima	YIN	90,470	90,000	90,000	Endnote 5
9160	Construct Sediment Settling Basin	Yakima	KRD	5,000	0	0	Endnote(s) 5,7
9161	Improve Return Flow Water Quality From Farms	Yakima	KRD	22,000	20,000	20,000	Endnote(s) 5,7
9162	Improve Water Quality Monitoring Program	Yakima	KRD	10,000	0	0	Endnote(s) 5,7
9705200	Enhancement Between Selah and Union Gaps	Yakima	YIN	474,240	250,000	250,000	Endnote 7
9705300	Toppenish-Simcoe Instream Flow Restoration	Yakima	YIN	500,002	300,000	49,000	Endnote 7
Subregion: Upper Mid-Columbia							
9031	Implement Entiat Model Watershed Plan	Entiat	CCCD	199,628	210,000	180,000	Need better explanation of expected benefits
9015	Enhance and Protect Fisheries in the Wolf Creek Watershed	Methow	WCRD	549,300	549,300	0	Budget reduction justification forthcoming
9024	Methow Tributaries Fish Passage	Methow	USFS	5,700	0	0	Endnote 5
9025	Prevent Mortality in Methow Endangered and Proposed Fish	Methow	USFS	25,000	0	0	Endnote 5
9026	Expand Respect the River	Methow	USFS	34,000	18,000	18,000	Endnote 5

* This is the sponsor-solicited budget; CBFWA funding recommendation will be determined as funds become available

ID	Title	Subregion	Sponsor	Solicited*	FY00	FY01	Notes
9027	Prevent Pollution of Methow River	Methow	USFS	14,600	0	0	Endnote 5
9028	Reduce Sediment in Frazer Creek, Beaver Creek, Methow	Methow	USFS	37,673	0	0	Endnote 5
9039	Increase Stream Flow in the Methow River and Provide Trail-Based Recreation	Methow		14,840	0	0	Pending
9086	Coordinate Assessment and Prioritization of Key Habitats in Methow Basin	Methow	PWI	599,000	640,000	50,000	Endnote 7
9097	Methow Basin Side Channel Habitat Construction	Methow	YIN	525,000	435,000	435,000	Pending
9155	Establish the Methow Watershed Council	Methow		58,076	58,075	58,075	Endnote 7
9017	Improve Anadromous Fish Habitat and Passage in Omak Cr	Okanogan	CCT	246,180	246,180	121,180	Budget constraints
9050	Remove 23 Migrational Barriers and Restore Riparian Vegetation on Chumstick	Wenatchee	USFWS	200,000	0	0	Endnote 7
Subregion: Upper Columbia							
9018	Assess Habitat for Anadromous Fish Upriver of Chief Joseph Dam	Upper Columbia Mainstem	CCT	171,900	171,900	131,900	Endnote 7
Subregion: Lower Snake							
9082	Evaluate Feed Strategies to Reduce Residualism & Promote Smolting in Stlhd	Clearwater	IFRO-USFWS	388,200	388,200	388,200	Pending
9163	West Fork Squaw Creek Fish Passage Project	Clearwater	USFS	100,000	0	0	Defer
9607706	Restore Lolo Watershed	Clearwater	USFS	87,635	90,000	90,000	Defer
9607707	Restore Squaw and Papoose Watersheds	Clearwater	USFS	106,925	100,000	100,000	Defer
9090	Recondition Wild Steelhead Kelts For Repeat Spawning	Lower Snake Mainstem	CRITFC	56,660	85,741	13,635	Potential ESA need
9014	Restore Habitat within Dredge Tailings on the Yankee Fork Salmon River	Salmon	SBT, IDFG	202,260	900,000	500,000	Defer pending availablity of funds
9121	Assesment Salmon River Subbasin	Salmon	NPT	27,083	0	0	Pending
9151	Assess Adult Steelhead Escapement in the Secesh River System	Salmon	NPT	65,494	60,000	0	Defer
9008	Eval. of Fall Chinook Production & Habitat Conditions in Lw.Tucannon River	Tucannon	WDFW	91,928	96,524	101,351	Not urgent enough yet - defer
Subregion: Systemwide							
9049	Feasibility Study for a State-Wide Water Quality Data Sharing	Systemwide		66,375	37,843	0	Pending

* This is the sponsor-solicited budget; CBFWA funding recommendation will be determined as funds become available

ID	Title	Subregion	Sponsor	Solicited*	FY00	FY01	Notes
	Mechanism						
9083	Develop Tools to Evaluate the Effects of Selective Fisheries on Chinook	Systemwide	NOAA	189,200	250,000	0	Pending
9099	Educate Landowners and Agencies on Salmon Stream Restoration Methods	Systemwide	OSU Ext	838,111	744,387	698,582	Pending
9142	Produce Watershed Analysis Procedure for Salmon Habitat Restoration	Systemwide	CRITFC	148,886	62,036	0	Pending
9143	Evaluate Disease Interactions Between Wild and Hatchery Salmonids	Systemwide	OSU	284,588	294,405	285,820	Pending
9147	Prioritize Research and Restoration Needs for Pacific Lamprey	Systemwide	ODFW	21,205	2,500	0	Pending - need to compare work with other lamprey projects
9148	Develop Open Formula Diets to Yield Quality Smolts	Systemwide		104,436	98,486	86,586	Pending
		Anadromous Fish total:		**16,747,306**	**14,215,241**	**11,578,766**	

Resident Fish Projects

Subregion: Upper Columbia

9502700	Assess Limiting Factors of the Lake Roosevelt White Sturgeon Population	Upper Columbia Mainstem	STOI	264,000	264,000	264,000	

Subregion: Lower Snake

9056	Evaluate Status of White Sturgeon in the Hells Canyon Reach Snake River, ID	Snake River Drainage, Idaho	IDFG	102,180	107,320	112,690	

Subregion: Upper Snake

9020	Genetic Analysis of Native Fish on the Duck Valley Indian Reservation	Owyhee	SPT	150,000	150,000	150,000	
9093	Consumptive Sturgeon Fishery-Hells Canyon and Oxbow Reservoirs	Snake	NPT	250,000	250,000	250,000	Fund project in FY99 as soon as money is identified in the BPA Quarterly Review
		Resident Fish total:		**766,180**	**771,320**	**776,690**	

Wildlife Projects

* This is the sponsor-solicited budget; CBFWA funding recommendation will be determined as funds become available

ID	Title	Subregion	Sponsor	Solicited*	FY00	FY01	Notes
Subregion: Lower Snake							
9096	Northeast Oregon Wildlife Mitigation O&M Trust Fund	Grande Ronde	NPT	1,200,000	1,200,000	1,158,766	To be funded at $3,392,822 only if substantial additional funds become available. Caucus is drafting programmatic policy on trust funds.
		Wildlife total:		**1,200,000**	**1,200,000**	**1,158,766**	

Endnotes: Anadromous Fish Managers' Reasons for not Funding Projects

1. Not urgent. Proposed activities would not produce significant near-term survival improvement nor risk a lost opportunity within the next 1-3 years.
2. Duplicates ongoing work. Some or all of proposed activities are similar or identical to work already funded. Better knowledge or coordination of past or ongoing projects would have reduced or eliminated project need.
3. Did not respond adequately to technical criteria. Proposal was either incomplete but did not provide adequate information to determine whether technical criteria were met, or was complete but did not meet technical criteria.
4. Questionable management value. Proposal was either incomplete but did not provide adequate information to determine whether management criteria were met or complete but did not meet critical management criteria.
5. In-lieu funding issue. Proposed tasks appear to be "in lieu of other expenditures authorized or required from other entities under other agreements or provisions of law". (Section 4.(h)(10)(A) of PNW Power Act).
6. Cost issues. Proposed budget and/or out-year costs were unknown or judged to be high in relation to the cost of similar projects or activities.
7. Budget constraints. Proposal was found to be technically sound and appropriate but was deferred because other work was judged more urgent and funds were not adequate
8. for all needed work.

Table 5. FY99 Tier 3 Projects (Not Recommended)

Sorted by Caucus, Subregion and Subbasin

ID	Title	Subregion	Sponsor	Soliticed	FY00	FY01	Notes
Anadromous Fish Projects							
Subregion: Lower Columbia							
9123	Restore Chinook Watershed	Chinook		334,750	334,750	200,000	Endnote(s) 1,3,4,6
9088	Implement Best Management Practices	Cowlitz	CCD and WCD	98,211	75,000	75,000	Endnote 4
9127	Development of a Cowlitz Watershed Management Plan	Cowlitz		58,000	0	0	Endnote(s) 1,2,4
9058	Restore Chinook Passage into Woodard Creek & Enhance Habitat	Lower Columbia Mainstem	CRGNSA	87,624	21,760	18,684	
9135	Assess Impacts of Hydro Operations on Mainstem Habitats for Fish	Lower Columbia Mainstem, Lower Snake	USGS - CRRL	138,552	250,000	250,000	Endnote 1
Subregion: Lower Mid-Columbia							
9040	Central Oregon Watershed Enhancement and Outreach	Deschutes	OSU Ext	206,231	139,538	0	Endnote(s) 1,5,7
9303000	Buck Hollow Watershed Enhancement	Deschutes	WCSWCD	99,961	90,000	0	Endnote(s) 3,4
9091	South Tower Fire Recovery Projects	John Day	USFS	145,000	145,000	145,000	Endnote(s) 5,3
8400800	North Fork John Day Habitat Improvement	John Day	USFS	30,000	26,000	26,000	Endnote(s) 5,4
9066	Protect Klickitat River and Wind River Salmonids	Klickitat	WDFW	224,161	0	0	Endnote 4
9080	Incidence and Effects of Gas Bubble Trauma on Salmonid & Resident Fish	Lower Mid-Columbia Mainstem	USGS-BRD	195,616	198,000	160,000	Endnote(s) 1,4
9141	Strategies For Riparian Recovery: Plant Succession & Salmon	Umatilla	OSU	401,678	378,000	396,900	
9164	Analyze Ahtanum Creek Storage Project	Yakima	AID	2,921,000	0	0	Endnote(s) 1,4
Subregion: Upper Mid-Columbia							
9054	Reduce Erosion, Identify Access and Improve... at Bonn. Power Line Corridor	Wenatchee	USFS	111,600	55,000	170,000	Need to fund from the transmission side rather than the power side of BPA
Subregion: Lower Snake							
9118	Restore West Fork Little Bear Creek For Steelhead	Clearwater	PCEI	517,000	50,000	20,000	Endnote 1

ID	Title	Subregion	Sponsor	Soliticed	FY00	FY01	Notes
9029	Monitoring Water Quality With Data Collection Platforms	Grande Ronde		366,000	300,000	350,000	Endnote(s) 1,2,4
9085	Propagate Native Plant Species for Revegetation & Riparian Restoration Proj	Grande Ronde	USFWS	47,092	86,810	85,000	Endnote(s) 5,7
9119	Public-Private Cooperative Resource Mgmt in Lower Joseph Cr Watershed	Grande Ronde		32,220	0	0	Endnote(s) 1,2,3,4
9016	Research/Evaluate Restoration of NE Ore Streams and Develop Mgmt Guidelines	Grande Ronde, John Day, Umatilla	OSU / U of O	287,574	302,710	318,642	Endnote(s) 1,2,4
9034	Reduce Sediment Delivery From Kline Mountain Road to the S.F. Salmon River.	Salmon	USFS, BNF, Cascade RD	307,042	0	0	Endnote 5
9051	Stabilize Blowout Creek (South Fork of Meadow Creek)	Salmon	USFS	335,117	18,590	3,590	Endnote(s) 1,3,4,5
9152	Feasibility of Sockeye Reintroduction to Wallowa and Warm Lakes	Salmon	NPT	260,300	205,000	0	Endnote(s) 1,4
9030	Etiology of Headburns in Returning Adult Salmonids	Snake	AQT	119,097	123,860	128,815	Might be considered under new steelhead ESA
Subregion: Upper Snake							
9022	Reintroduction of Salmon & Steelhead - Mary's Cr. & Owyhee R.	Owyhee	SPT	153,200	153,200	153,200	Not feasible at this time
Subregion: Systemwide							
9047	Use Unsteady Flow to Aid Mainstem Passage of Junenile Salmonids	Mainstem	ORNL	199,700	190,000	0	Endnote(s) 1,4
9077	Evaluation of Interactions between American Shad and Salmon in Columbia R	Mainstem	USGS-BRD	547,634	600,000	650,000	Endnote 4
9078	Water Temperature Effects on Fall Chinook Salmon in the Snake & Columbia R	Mainstem	USGS	700,000	70,000	70,000	Endnote 7
9108	Evaluate Strobe Lights as a Juvenile Salmonid Guidance Behavioral Tool	Mainstem	WDFW	1,187,700	1,014,000	729,200	Endnote(s) 1,4
9112	Numerical Evaluation of Flow Modification on Salmonid Migration	Mainstem	UMich	172,000	0	0	Endnote 4
8910800	Monitor and Evaluate Modeling Support	Mainstem	UW	411,656	400,000	400,000	Duplicates 9700200
9105100	Monitoring and Evaluation Statistical Support	Mainstem	UW	332,774	334,000	348,000	Duplicates FPC

ID	Title	Subregion	Sponsor	Soliticed	FY00	FY01	Notes
9035	Evaluate Estuarine & Nearshore-ocean Migratory Behavior of Juvenile Salmon	Ocean/estuary	NMFS/NW FSC	159,900	320,000	320,000	Endnote(s) 1,2,4
9157	Effects of Ocean Conditions on the Growth and Survival of Salmonids	Ocean/estuary	CRITFC	86,442	28,355	0	Endnote 1
9115	Develop TDG Abatement Plan of Action Using Wheels Pools and Falls Approach	Snake, Willamette and Rogue	SMR	45,000	0	0	Endnote(s) 1,4,6
9098	Technical Support For PATH - James J. Anderson	Systemwide		50,000	50,000	50,000	Credit against 9700200
9113	Evaluate Effects of Hydraulic Turbulence on Survival of Migratory Fishes	Systemwide	ORNL	238,000	0	0	Endnote 4
9125	Columbia River Basin Fish Key	Systemwide		130,377	0	0	Endnote(s) 1,2
9136	Influence of Marine-Derived Nutrient Influx on CRB Salmonid Production		Systemwide	USGS	130,888	10,537	0 Endnote 5
8907201	Independent Scientific Advisory Board Support	Systemwide	DOE/ORNL	99,840	100,000	100,000	See 9600500
9601900	Second-Tier Database For Ecosystem Focus	Systemwide	BPA-EWI	164,000	0	0	Duplicates FPC and StreamNet
		Anadromous Fish total:		**12,132,937**	**6,070,110**	**5,168,031**	

Resident Fish Projects

Subregion: Lower Columbia

9156	White Salmon River Watershed Enhancement Project	Little White Salmon	UCD	126,306	130,684	135,372	See Appendix C
9079	Inventory Resident Fish Populations in Bonneville, Dalles, John Day Res.	Lower Columbia Mainstem	USGS	240,741	389,021	389,917	See Appendix C

Subregion: Lower Mid-Columbia

9103	Upper Deschutes Basin Watershed Coordinator/Council Support	Deschutes	DCWC	32,100	46,000	50,500	See Appendix C
9081	Impact of Exotic Fishes and Macrophytes on Juvenile Salmonids	Lower Mid-Columbia Mainstem	USGS	179,454	184,838	150,000	See Appendix C
9110	Assess Resident Fish Within Toppenish Creek and Satus Creek	Yakima	YIN	71,215	67,715	67,715	See Appendix C

Subregion: Upper Mid-Columbia

9046	Identify Res Fish & Macroinvertebrate Taxa & Function in	Methow		8,900	8,980	0	See Appendix C

ID	Title	Subregion	Sponsor	Soliticed	FY00	FY01	Notes
	Anad Fish Habitat						
Subregion: Upper Columbia							
9111	Evaluate Effects of Food Web Changes on Native Fish Restoration Strategies	Flathead		1,023,737	771,768	692,780	See Appendix C
9202406	Public Fisheries Education/Enhanced Protection of Resident/ESA Species	Flathead, Kootenai	MFWP	123,693	127,403	131,225	See Appendix C
9124	Purchase Conservation Easement from Plum Creek Timber	Kootenai	MFWP	2,000,000	2,000,000	2,000,000	See Appendix C
9041	Enhance/Protect Imperiled Native Fish Species Through Improved Education...	Kootenai, Flathead	MFWP	73,538	79,936	79,936	See Appendix C
Subregion: Lower Snake							
9055	Evaluate Movement Patterns of Bull Trout in Dworshak Reservoir.	Clearwater	IDFG	84,840	81,648	85,730	See Appendix C
9048	Transfer Attributes From 1:100,000 to 1:24,000-Scale Hydrography	Snake, Salmon, Clearwater, Coeur d'Alene, Selway,	IDWR	216,855	214,355	0	See Appendix C
Subregion: Upper Snake							
9052	Demonstrate that a Translucent Pipeline Feels Normal to Fish	Mid Snake	FPI	7,944,300	2,000,000	0	See Appendix C
9053	Kirby (Atlanta) Dam Fish Ladder	Mid Snake	USFS, BNF	300,000	0	0	See Appendix C
Subregion: Systemwide							
9134	Effects of Catch & Release Angling and Exhaustive Stress on White Sturgeon	Systemwide	USGS - CRRL	205,108	300,000	320,000	See Appendix C
		Resident Fish total:		**12,630,787**	**6,402,348**	**4,103,175**	

Wildlife Projects

Subregion: Lower Columbia							
9206801	Implementation of Willamette Basin Mitigation Program--Watershed	Willamette	ODFW	500,000	200,000	200,000	Project withdrawn by sponsor - duplication
Subregion: Lower Snake							
9043	Introducing Systems Science to Planning and Implementing F&W Recovery	Grande Ronde	DU	1,143,000	7,500,000	16,400,000	Does not meet threshold criteria E, F
Subregion: Upper Snake							

ID	Title	Subregion	Sponsor	Soliticed	FY00	FY01	Notes
9021	Mitigate Wildlife Losses on the Duck Valley Indian Reservation	Owyhee	SPT	253,200	253,200	253,200	Is not consistent with wildlife program approach (threshold criterion E)
9023	Enforcement of ESA Laws on the Duck Valley Indian Reservation	Owyhee	SPT	92,500	92,500	92,500	Does not meet threshold criterion D
9042	Critical Ecosystem Reclamation, Recovery and Recharge Project	Upper Snake	SBT	266,560	175,560	175,560	Is not consistent with wildlife program, does not meet threshold criterion A
		Wildlife total:		**2,255,260**	**8,221,260**	**17,121,260**	

Endnotes: Anadromous Fish Managers' Reasons for not Funding Projects

1. Not urgent. Proposed activities would not produce significant near-term survival improvement nor risk a lost opportunity within the next 1-3 years.
2. Duplicates ongoing work. Some or all of proposed activities are similar or identical to work already funded. Better knowledge or coordination of past or ongoing projects would have reduced or eliminated project need.
3. Did not respond adequately to technical criteria. Proposal was either incomplete but did not provide adequate information to determine whether technical criteria were met, or was complete but did not meet technical criteria.
4. Questionable management value. Proposal was either incomplete but did not provide adequate information to determine whether management criteria were met or complete but did not meet critical management criteria.
5. In-lieu funding issue. Proposed tasks appear to be "in lieu of other expenditures authorized or required from other entities under other agreements or provisions of law". (Section 4.(h)(10)(A) of PNW Power Act).
6. Cost issues. Proposed budget and/or out-year costs were unknown or judged to be high in relation to the cost of similar projects or activities.
7. Budget constraints. Proposal was found to be technically sound and appropriate but was deferred because other work was judged more urgent and funds were not adequate for all needed work.

Table 6. FY99 Projects Sorted by Project ID

ID	Title	Subregion	Subbasin	Caucus*	Tier
9001	Monitor Water Quality and Quantity in Eastern Klickitat	Lower Mid-Columbia	Klickitat	A	2
9002	Monitor Water Quality and Quantity in L. Klickitat R. and	Lower Mid-Columbia	Klickitat	A	2
9003	Restore/Enhance Trout Creek @ Ashwood Phase II	Lower Mid-Columbia	Deschutes	A	2
9004	Restore/Enhance Trout Creek @ Ashwood Phase I	Lower Mid-Columbia	Deschutes	A	2
9005	Irrigation System Replacement Trout Cr. @ Willowdale II	Lower Mid-Columbia	Deschutes	A	1
9006	Restore/Enhance Trout Creek @ Willowdale	Lower Mid-Columbia	Deschutes	A	2
9007	Jefferson Co./Middle Deschutes Watershed	Lower Mid-Columbia	Deschutes	A	1
9008	Eval. of Fall Chinook Production & Habitat Conditions in	Lower Snake	Tucannon	A	2
9009	Restore Salmon River (Challis, ID) Area to Healthy	Lower Snake	Salmon	A	1
9010	Assess Fish Habitat & Salmonids in Walla Walla	Lower Mid-Columbia	Walla Walla	A	1
9011	Characterize & Quantify Residual Steelhead in Clearwater	Lower Snake	Clearwater	A	1
9012	Mitigate Effects of Runoff & Erosion on Salmonid	Lower Mid-Columbia	John Day	A	1
9013	Hellsgate Big Game Winter Range Continuing	Upper Columbia	Upper Columbia	W	1
9014	Restore Habitat within Dredge Tailings on the Yankee	Lower Snake	Salmon	A	2
9015	Enhance and Protect Fisheries in the Wolf Creek	Upper Mid-Columbia	Methow	A	2
9016	Research/Evaluate Restoration of NE Ore Streams and	Lower Snake	Grande Ronde, John	A	3
9017	Improve Anadromous Fish Habitat and Passage in Omak	Upper Mid-Columbia	Okanogan	A	2
9018	Assess Habitat for Anadromous Fish Upriver of Chief	Upper Columbia	Upper Columbia	A	2
9019	Monitor Reproductive Physiology of Columbia River	Lower Columbia	Lower Columbia	A	2
9020	Genetic Analysis of Native Fish on the Duck Valley	Upper Snake	Owyhee	R	2
9021	Mitigate Wildlife Losses on the Duck Valley Indian	Upper Snake	Owyhee	W	3
9022	Reintroduction of Salmon & Steelhead - Mary's Cr. &	Upper Snake	Owyhee	A	3
9023	Enforcement of ESA Laws on the Duck Valley Indian	Upper Snake	Owyhee	W	3
9024	Methow Tributaries Fish Passage	Upper Mid-Columbia	Methow	A	2
9025	Prevent Mortality in Methow Endangered and Proposed	Upper Mid-Columbia	Methow	A	2
9026	Expand Respect the River	Upper Mid-Columbia	Methow	A	2
9027	Prevent Pollution of Methow River	Upper Mid-Columbia	Methow	A	2
9028	Reduce Sediment in Frazer Creek, Beaver Creek, Methow	Upper Mid-Columbia	Methow	A	2
9029	Monitoring Water Quality With Data Collection	Lower Snake	Grande Ronde	A	3
9030	Etiology of Headburns in Returning Adult Salmonids	Lower Snake	Snake	A	3
9031	Implement Entiat Model Watershed Plan	Upper Mid-Columbia	Entiat	A	2
9032	Teach Adults to Become Holistic Master Watershed	Lower Mid-Columbia	Yakima	A	2
9033	Document Native Trout Populations	Lower Mid-Columbia	Wind, Little White	R	1
9034	Reduce Sediment Delivery From Kline Mountain Road to	Lower Snake	Salmon	A	3
9035	Evaluate Estuarine & Nearshore-ocean Migratory	Systemwide	Ocean/estuary	A	3
9036	McKenzie Watershed Habitat Assessment and Project	Lower Columbia	Willamette	A	2
9037	Acquire Fish and Wildlife Habitat in the McKenzie	Lower Columbia	Willamette	A	2
9038	Evaluate Spring Chinook Life History-habitat	Lower Columbia	Willamette	A	2
9039	Increase Stream Flow in the Methow River and Provide	Upper Mid-Columbia	Methow	A	2
9040	Central Oregon Watershed Enhancement and Outreach	Lower Mid-Columbia	Deschutes	A	3
9041	Enhance/Protect Imperiled Native Fish Species Through	Upper Columbia	Kootenai, Flathead	R	3
9042	Critical Ecosystem Reclamation, Recovery and Recharge	Upper Snake	Upper Snake	W	3
9043	Introducing Systems Science to Planning and	Lower Snake	Grande Ronde	W	3
9044	Replace Chumstick Creek Culvert	Upper Mid-Columbia	Wenatchee	A	1
9045	Eliminate Gravel Push-Up Dams on Lower North Fork	Lower Mid-Columbia	John Day	A	1
9046	Identify Res Fish & Macroinvertebrate Taxa & Function	Upper Mid-Columbia	Methow	R	3

* (A)nadromous Fish, (R)esident Fish, (W)ildlife

ID	Title	Subregion	Subbasin	Caucus*	Tier
9047	Use Unsteady Flow to Aid Mainstem Passage of Junenile	Systemwide	Mainstem	A	3
9048	Transfer Attributes From 1:100,000 to 1:24,000-Scale	Lower Snake	Snake, Salmon,	R	3
9049	Feasibility Study for a State-Wide Water Quality Data	Systemwide	Systemwide	A	2
9050	Remove 23 Migrational Barriers and Restore Riparian	Upper Mid-Columbia	Wenatchee	A	2
9051	Stabilize Blowout Creek (South Fork of Meadow Creek)	Lower Snake	Salmon	A	3
9052	Demonstrate that a Translucent Pipeline Feels Normal to	Upper Snake	Mid Snake	R	3
9053	Kirby (Atlanta) Dam Fish Ladder	Upper Snake	Mid Snake	R	3
9054	Reduce Erosion, Identify Access and Improve... at Bonn.	Upper Mid-Columbia	Wenatchee	A	3
9055	Evaluate Movement Patterns of Bull Trout in Dworshak	Lower Snake	Clearwater	R	3
9056	Evaluate Status of White Sturgeon in the Hells Canyon	Lower Snake	Snake River Drainage,	R	2
9057	Evaluate Status of Pacific Lamprey in the Clearwater	Lower Snake	Clearwater	A	1
9058	Restore Chinook Passage into Woodard Creek &	Lower Columbia	Lower Columbia	A	3
9059	Restore Anadromous Fish Habitat in the Little Canyon	Lower Snake	Clearwater	A	1
9060	Restore Anadromous Fish Habitat in the Nichols Canyon	Lower Snake	Clearwater	A	1
9061	River Wetlands Restoration and Evaluation Program	Lower Columbia	Sandy	W	1
9062	Sandy River Delta Riparian Reforestation	Lower Columbia	Sandy	W	1
9063	Ocean Survival of Salmonids Relative to Migrational	Mainstem	Ocean/estuary	A	1
9064	Analyze the Persistence and Spatial Dynamics of Snake	Lower Snake	Salmon	A	1
9065	Little Naches Streambank Restoration	Lower Mid-Columbia	Yakima	A	2
9066	Protect Klickitat River and Wind River Salmonids	Lower Mid-Columbia	Klickitat	A	3
9067	Coordinate/Facilitate Watershed Project	Lower Mid-Columbia	Yakima	A	1
9068	Improve Stream Habitat Through Reduction in Farm	Lower Mid-Columbia	Yakima	A	2
9069	Enhance Upper Yakima River Basin Fish Habitat	Lower Mid-Columbia	Yakima	A	2
9070	Improve Water Quality Through Sedimentation and	Lower Mid-Columbia	Yakima	A	2
9071	Improve Yakima River Water Quality	Lower Mid-Columbia	Yakima	A	2
9072	Improve Return Flow Water Quality	Lower Mid-Columbia	Yakima	A	2
9073	Improve Water Quality Monitoring Program	Lower Mid-Columbia	Yakima	A	2
9074	Construct Sediment Settling Basins	Lower Mid-Columbia	Yakima	A	2
9075	Construct Wetlands	Lower Mid-Columbia	Yakima	A	2
9076	Evaluate Return Flow Recovery	Lower Mid-Columbia	Yakima	A	2
9077	Evaluation of Interactions between American Shad and	Systemwide	Mainstem	A	3
9078	Water Temperature Effects on Fall Chinook Salmon in the	Systemwide	Mainstem	A	3
9079	Inventory Resident Fish Populations in Bonneville,	Lower Columbia	Lower Columbia	R	3
9080	Incidence and Effects of Gas Bubble Trauma on Salmonid	Lower Mid-Columbia	Lower Mid-Columbia	A	3
9081	Impact of Exotic Fishes and Macrophytes on Juvenile	Lower Mid-Columbia	Lower Mid-Columbia	R	3
9082	Evaluate Feed Strategies to Reduce Residualism &	Lower Snake	Clearwater	A	2
9083	Develop Tools to Evaluate the Effects of Selective	Systemwide	Systemwide	A	2
9084	Assessing Genetic Variation Among Columbia Basin	Systemwide	Systemwide	R	1
9085	Propagate Native Plant Species for Revegetation &	Lower Snake	Grande Ronde	A	3
9086	Coordinate Assessment and Prioritization of Key	Upper Mid-Columbia	Methow	A	2
9087	Acquire 1860 Fifteenmile Cr irrigation water right and	Lower Mid-Columbia	Fifteenmile	A	1
9088	Implement Best Management Practices	Lower Columbia	Cowlitz	A	3
9089	Classify Riparian and Wetland Vegetation in the	Lower Mid-Columbia	Lower Mid-Columbia	A	2
9090	Recondition Wild Steelhead Kelts For Repeat Spawning	Lower Snake	Lower Snake	A	2
9091	South Tower Fire Recovery Projects	Lower Mid-Columbia	John Day	A	3
9092	Umatilla Tribal Fish and Wildlife Enforcement	Lower Mid-Columbia	Umatilla	A	1
9093	Consumptive Sturgeon Fishery-Hells Canyon and Oxbow	Upper Snake	Snake	R	2
9094	Produce Kokanee Salmon in Net Pens for Release into	Upper Columbia	Upper Columbia	R	1
9095	Bull Trout Population Assessment in the Columbia River	Lower Mid-Columbia	Wind, Little White	R	1
9096	Northeast Oregon Wildlife Mitigation O&M Trust Fund	Lower Snake	Grande Ronde	W	2

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9097	Methow Basin Side Channel Habitat Construction	Upper Mid-Columbia	Methow	A	2
9098	Technical Support For PATH - James J. Anderson	Systemwide	Systemwide	A	3
9099	Educate Landowners and Agencies on Salmon Stream	Systemwide	Systemwide	A	2
9100	Reestablish Safe Access into Tributaries of the Yakima	Lower Mid-Columbia	Yakima	A	1
9101	Restore Upper Toppenish Creek Watershed	Lower Mid-Columbia	Yakima	A	1
9102	Ahtanum Creek Watershed Assessment	Lower Mid-Columbia	Yakima	A	1
9103	Upper Deschutes Basin Watershed Coordinator/Council	Lower Mid-Columbia	Deschutes	R	3
9104	Conduct Baseline Habitat and Pop. Dynamics Studies on	Lower Columbia	Lewis	A	1
9105	Determine if Salmon are Successfully Spawning Below	Lower Columbia	Lower Columbia	A	1
9106	Aquisition of Malheur Wildlife Mitigation Site	Upper Snake	Malheur	W	1
9107	North Fork Malheur River Bull Trout and Redband Trout	Upper Snake	Malheur	R	1
9108	Evaluate Strobe Lights as a Juvenile Salmonid Guidance	Systemwide	Mainstem	A	3
9109	Acquisition of Water and Floodplain Fisheries Habitat in	Lower Mid-Columbia	Yakima	A	2
9110	Assess Resident Fish Within Toppenish Creek and Satus	Lower Mid-Columbia	Yakima	R	3
9111	Evaluate Effects of Food Web Changes on Native Fish	Upper Columbia	Flathead	R	3
9112	Numerical Evaluation of Flow Modification on Salmonid	Systemwide	Mainstem	A	3
9113	Evaluate Effects of Hydraulic Turbulence on Survival of	Systemwide	Systemwide	A	3
9114	Stabilizing Stream Channels in the Cabin Creek	Lower Mid-Columbia	Yakima	A	2
9115	Develop TDG Abatement Plan of Action Using Wheels	Systemwide	Snake, Willamette and	A	3
9116	Rasor Ranch Acquisition/Crab Creek Watershed	Upper Columbia	Upper Columbia	W	1
9117	Facilitation Services for the Regional Forum	Mainstem	Mainstem	A	1
9118	Restore West Fork Little Bear Creek For Steelhead	Lower Snake	Clearwater	A	3
9119	Public-Private Cooperative Resource Mgmt in Lower	Lower Snake	Grande Ronde	A	3
9120	Protecting and Restoring Big Canyon Creek Watershed	Lower Snake	Clearwater	A	1
9121	Assesment Salmon River Subbasin	Lower Snake	Salmon	A	2
9122	Rehabilitate Lapwai Creek	Lower Snake	Clearwater	A	1
9123	Restore Chinook Watershed	Lower Columbia	Chinook	A	3
9124	Purchase Conservation Easement from Plum Creek	Upper Columbia	Kootenai	R	3
9125	Columbia River Basin Fish Key	Systemwide	Systemwide	A	3
9126	Hood River Fish Habitat Project	Lower Mid-Columbia	Hood	A	1
9127	Development of a Cowlitz Watershed Management Plan	Lower Columbia	Cowlitz	A	3
9130	Burns Paiute Mitigation Coordinator	Upper Snake	Malheur	W	1
9131	Evaluate Fall Chinook & Chum Spawning, Production &	Systemwide	Systemwide	A	1
9132	Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Watershed	Systemwide	Systemwide	A	1
9133	Bakeoven Riparian Assessment	Lower Mid-Columbia	Deschutes	A	1
9134	Effects of Catch & Release Angling and Exhaustive	Systemwide	Systemwide	R	3
9135	Assess Impacts of Hydro Operations on Mainstem	Lower Columbia	Lower Columbia	A	3
9136	Influence of Marine-Derived Nutrient Influx on CRB	Systemwide	Systemwide	A	3
9137	John Day Watershed Restoration	Lower Mid-Columbia	John Day	A	1
9138	Warm Springs Reservation 1999 Watershed	Lower Mid-Columbia	Deschutes	A	1
9139	Acquisition of Pine Creek Ranch	Lower Mid-Columbia	John Day	A	1
9140	Acquisition of Pine Creek Ranch	Lower Mid-Columbia	John Day	W	1
9141	Strategies For Riparian Recovery: Plant Succession &	Lower Mid-Columbia	Umatilla	A	3
9142	Produce Watershed Analysis Procedure for Salmon	Systemwide	Systemwide	A	2
9143	Evaluate Disease Interactions Between Wild and	Systemwide	Systemwide	A	2
9144	Monitor Natural Escapement & Productivity of John Day	Lower Mid-Columbia	John Day	A	1
9145	Evaluate the Status of Columbia River Sea-Run Cutthroat	Lower Mid-Columbia	Hood, Wind	A	2
9146	Evaluate Effects of Habitat Work Conducted in	Lower Mid-Columbia	Fifteenmile	A	1
9147	Prioritize Research and Restoration Needs for Pacific	Systemwide	Systemwide	A	2
9148	Develop Open Formula Diets to Yield Quality Smolts	Systemwide	Systemwide	A	2

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9149	Evaluate and Monitor Bacterial Cold Water Disease	Lower Columbia	Lower Columbia	A	2
9150	Captive Broodstock Artificial Propagation	Lower Snake	Grande Ronde	A	1
9151	Assess Adult Steelhead Escapement in the Secesh River	Lower Snake	Salmon	A	2
9152	Feasibility of Sockeye Reintroduction to Wallowa and	Lower Snake	Salmon	A	3
9153	Preserve Cryogenically the Gametes of selected	Lower Mid-Columbia	Deschutes	A	2
9154	Wind River Ecosystem Restoration	Lower Mid-Columbia	Wind	A	1
9155	Establish the Methow Watershed Council	Upper Mid-Columbia	Methow	A	2
9156	White Salmon River Watershed Enhancement Project	Lower Columbia	Little White Salmon	R	3
9157	Effects of Ocean Conditions on the Growth and Survival	Systemwide	Ocean/estuary	A	3
9158	Little Naches River Riparian and In-Channel Habitat	Lower Mid-Columbia	Yakima	A	2
9159	Rock Creek Watershed Assessment and Restoration	Lower Mid-Columbia	Rock Creek	A	2
9160	Construct Sediment Settling Basin	Lower Mid-Columbia	Yakima	A	2
9161	Improve Return Flow Water Quality From Farms	Lower Mid-Columbia	Yakima	A	2
9162	Improve Water Quality Monitoring Program	Lower Mid-Columbia	Yakima	A	2
9163	West Fork Squaw Creek Fish Passage Project	Lower Snake	Clearwater	A	2
9164	Analyze Ahtanum Creek Storage Project	Lower Mid-Columbia	Yakima	A	3
8201300	Coded-Wire Tag Recovery Program	Systemwide	Systemwide	A	1
8331900	New Fish-Tagging System	Systemwide	Systemwide	A	1
8332300	Monitor Smolts at the Head of Lower Granite Reservoir	Mainstem	Mainstem	A	1
8335000	Nez Perce Tribal Hatchery	Lower Snake	Clearwater	A	1
8343500	Operate and Maintain Umatilla Hatchery Satellite	Lower Mid-Columbia	Walla Walla	A	1
8343600	Umatilla Passage O&M	Lower Mid-Columbia	Umatilla	A	1
8346500	Libby and Hungry Horse Modeling Technical Analysis	Upper Columbia	Kootenai, Flathead	R	1
8346700	Mitigation for the Construction and Operation of Libby	Upper Columbia	Kootenai	R	1
8400800	North Fork John Day Habitat Improvement	Lower Mid-Columbia	John Day	A	3
8401400	Smolt Monitoring at Federal Dams	Mainstem	Mainstem	A	1
8402100	Protect and Enhance John Day River Fish Habitat	Lower Mid-Columbia	John Day	A	1
8402500	Protect and Enhance Fish Habitat in Grande Ronde Basin	Lower Snake	Grande Ronde	A	1
8503800	Colville Hatchery	Upper Columbia	Upper Columbia	R	1
8506200	Evaluate the Effectiveness of Fish Screens	Lower Mid-Columbia	Yakima	A	1
8605000	White Sturgeon Mitigation and Restoration in the	Lower Mid-Columbia	Lower Mid-Columbia	R	1
8612400	Inspection Service For Little Fall Creek Passage	Lower Columbia	Willamette	A	1
8709900	Dworshak Dam Impacts Assessment and Fisheries	Lower Snake	Clearwater	R	1
8710001	Enhance Umatilla River Basin Anadromous Fish Habitat	Lower Mid-Columbia	Umatilla	A	1
8710002	Protect & Enhance Coldwater Fish Habitat in the Umatilla	Lower Mid-Columbia	Umatilla	A	1
8712700	Smolt Monitoring By Non-Federal Agencies	Mainstem	Mainstem	A	1
8712702	Comparative Survival Rate Study (CSS) of Hatchery Pit	Mainstem	Mainstem	A	1
8712703	Imnaha River Smolt Monitoring Program Project	Lower Snake	Imnaha	A	1
8740100	Assess Smolt Condition for Travel Time Analysis:	Mainstem	Mainstem	A	1
8740700	Dworshak Impacts/M&E & Biological-Integrated Rule	Lower Snake	Clearwater	R	1
8802200	Trap and Haul in the Umatilla and Walla Walla Basins	Lower Mid-Columbia	Umatilla	A	1
8805301	Northeast Oregon Hatchery Master Plan	Lower Snake	Grande Ronde	A	1
8805302	Plan, Site, Design & Construct NEOH	Lower Mid-Columbia	Walla Walla	A	1
8805303	Hood River Production Program (HRPP)	Lower Mid-Columbia	Hood	A	1
8805304	Monitor Actions Implemented Under the Hood River	Lower Mid-Columbia	Hood	A	1
8805305	NE Oregon Hatchery Master Plan and Facilities - ODFW	Lower Snake	Grande Ronde	A	1
8806400	Kootenai River White Sturgeon Studies and	Upper Columbia	Kootenai	R	1
8806500	Kootenai River Fisheries Investigations	Upper Columbia	Kootenai	R	1
8810804	Streamnet: The Northwest Aquatic Information Network	Systemwide	Systemwide	A	1
8811500	Yakima Hatchery Construction	Lower Mid-Columbia	Yakima	A	1

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8812001	Yakima/Klickitat Fisheries Project Management	Lower Mid-Columbia	Yakima	A	1
8812005	Video Fish Monitoring Project	Lower Mid-Columbia	Yakima	A	1
8812008	Fisheries Technician Field Activities	Lower Mid-Columbia	Yakima	A	1
8815600	Stocking Fish in Lakes and Streams on the Duck Valley	Upper Snake	Owyhee	R	1
8816000	Willamette Hatchery Oxygen Supplementation	Lower Columbia	Willamette	A	1
8902401	Evaluate Juvenile Salmonid Outmigration and Survival in	Lower Mid-Columbia	Umatilla	A	1
8902700	Power/Repay O&M For USBR CPR Pumping Project	Lower Mid-Columbia	Umatilla	A	1
8902900	Hood River Production Program - Pelton Ladder -	Lower Mid-Columbia	Hood	A	1
8903500	Umatilla Hatchery Operation and Maintenance	Lower Mid-Columbia	Umatilla	A	1
8906200	Prepare Draft Annual Implementation Work Plan	Systemwide	Systemwide	A	1
8906500	Annual Fish Marking - Missing Hatchery Production	Systemwide	Systemwide	A	1
8906600	Annual Coded Wire Tag Program-Missing Production	Systemwide	Systemwide	A	1
8906900	Annual Coded Wire Tag Program - Missing Production	Systemwide	Systemwide	A	1
8907201	Independent Scientific Advisory Board Support	Systemwide	Systemwide	A	3
8909600	Monitor, Evaluate Genetic Characteristics of	Lower Snake	Grande Ronde	A	1
8909800	Salmon Supplementation Studies in Idaho Rivers	Lower Snake	Salmon, Clearwater	A	1
8909801	Salmon Supplementation Studies in Idaho Rivers	Lower Snake	Salmon, Clearwater	A	1
8909802	Salmon Supplementation Studies in Idaho Rivers	Lower Snake	Salmon, Clearwater	A	1
8909803	Salmon Supplementation Studies in Idaho Rivers	Lower Snake	Salmon, Clearwater	A	1
8910700	Statistical Support for Salmonid Survival Studies	Mainstem	Mainstem	A	1
8910800	Monitor and Evaluate Modeling Support	Systemwide	Mainstem	A	3
9000500	Umatilla Hatchery Monitoring and Evaluation	Lower Mid-Columbia	Umatilla	A	1
9000501	Umatilla and Walla Walla Basin Natural Production M&E	Lower Mid-Columbia	Umatilla	A	1
9001800	Evaluate Rainbow Trout Habitat/Passage Improvements	Upper Columbia	Upper Columbia	R	1
9004400	Implement Fisheries Enhancement Opportunities :Coeur	Upper Columbia	Coeur d'Alene	R	1
9004401	Lake Creek Land Acquisition and Enhancement	Upper Columbia	Coeur d'Alene	W	1
9005200	Performance/Stock Productivity Impacts of Hatchery	Systemwide	Systemwide	A	1
9005500	Steelhead Supplementation Studies in Idaho Rivers	Lower Snake	Salmon, Clearwater	A	1
9007700	Northern Squawfish Management Program	Mainstem	Mainstem	A	1
9007800	Evaluate Predator Control and Provide Technical Support	Systemwide	Systemwide	A	1
9008000	Columbia Basin Pit-Tag Information System	Mainstem	Mainstem	A	1
9009200	Wanaket Wildlife Mitigation Project	Lower Mid-Columbia	Lower Mid-Columbia	W	1
9009300	Life History and Genetic Analysis of Oncorhynchus	Mainstem	Mainstem	A	1
9101901	Hungry Horse Fisheries Mitigation Plan Flathead Lake	Upper Columbia	Flathead	R	1
9101903	Hungry Horse Dam Mitigation - Watershed Restoration	Upper Columbia	Flathead	R	1
9101904	Hungry Horse Mitigation - Hatchery-Based Impl. of	Upper Columbia	Flathead	R	1
9102800	Monitoring Smolt Migration of Wild Snake River	Lower Snake	Lower Snake	A	1
9102900	Life History and Survival of Fall Chinook Salmon in	Mainstem	Mainstem	A	1
9104600	Spokane Tribal (Galbraith Springs) Hatchery O&M	Upper Columbia	Upper Columbia	R	1
9104700	Sherman Creek Hatchery O&M	Upper Columbia	Upper Columbia	R	1
9105100	Monitoring and Evaluation Statistical Support	Systemwide	Mainstem	A	3
9105500	Supplementation Fish Quality (Yakima)	Lower Mid-Columbia	Yakima	A	1
9105700	Yakima Phase 2 Screen Fabrication	Lower Mid-Columbia	Yakima	A	1
9106000	Kalispel Pend Oreille Wetlands Wildlife Mitigation	Upper Columbia	Pend Oreille	W	1
9106100	WDFW Projects	Lower Mid-Columbia	Yakima	W	1
9106700	Idaho Water Rental: Resident Fish and Wildlife Impacts	Upper Snake	Upper Snake, Boise,	R	1
9107100	Snake River Sockeye Salmon Habitat and Limnological	Lower Snake	Salmon	A	1
9107200	Redfish Lake Sockeye Salmon Captive Broodstock	Lower Snake	Salmon	A	1
9107300	Idaho Natural Production Monitoring and Evaluation	Lower Snake	Salmon, Clearwater	A	1
9107500	Yakima Phase II Screens - Construction	Lower Mid-Columbia	Yakima	A	1

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9107800	Burlington Bottoms Wildlife Mitigation Project	Lower Columbia	Willamette	W	1
9200900	Yakima Screens - Phase II - O & M	Lower Mid-Columbia	Yakima	A	1
9201000	Habitat Restoration/Enhancement Fort Hall Reservation	Upper Snake	Upper Snake	R	1
9202200	Physiological Assessment of Wild and Hatchery Juvenile	Lower Mid-Columbia	Lower Mid-Columbia	A	1
9202401	Enhanced Harvest & Habitat Law Enforcement for	Mainstem	Mainstem	A	1
9202406	Public Fisheries Education/Enhanced Protection of	Upper Columbia	Flathead, Kootenai	R	3
9202408	Protect Critical Salmonid Habitat and Habitat Restoration	Lower Snake	Salmon	A	1
9202409	Enhance Law Enforcement for Fish & Wildlife and	Lower Snake	Clearwater	A	1
9202601	Grande Ronde Model Watershed - Project Planning	Lower Snake	Grande Ronde	A	1
9202602	Implement Eastern Washington Model Watershed Plans	Lower Snake	Tucannon	A	1
9202603	Idaho Model Watersheds Admin./Impl. Support	Lower Snake	Salmon	A	1
9202604	Spring Chinook Salmon Early Life History	Systemwide	Systemwide	A	1
9203200	Life-Cycle Model Development and Application to	Systemwide	Systemwide	A	1
9204000	Redfish Lake Sockeye Salmon Captive Broodstock	Lower Snake	Salmon	A	1
9204101	Evaluate Adult Migration in Lwr Col. River and	Mainstem	Mainstem	A	1
9204800	Hellsgate Big Game Winter Range	Upper Columbia	Upper Columbia	W	1
9205900	Amazon Basin/Eugene Wetlands Phase II	Lower Columbia	Willamette	W	1
9206100	Albeni Falls Wildlife Mitigation Project	Upper Columbia	Upper Columbia	W	1
9206200	Yakama Nation - Riparian/Wetlands Restoration	Lower Mid-Columbia	Yakima	W	1
9206800	Implementation of Willamette Basin Mitigation	Lower Columbia	Willamette	W	1
9206801	Implementation of Willamette Basin Mitigation	Lower Columbia	Willamette	W	3
9300802	Symptoms of GBT Induced in Salmon by TDGS of the	Mainstem	Mainstem	A	1
9301900	Hood River Production Program - Oak Springs,	Lower Mid-Columbia	Hood	A	1
9302900	Survival Estimates for Passage of Juvenile Salmonids	Mainstem	Mainstem	A	1
9303000	Buck Hollow Watershed Enhancement	Lower Mid-Columbia	Deschutes	A	3
9303501	Enhance Fish, Riparian and Wildlife Habitat within the	Lower Snake	Clearwater	A	1
9303701	Technical Assitance With Life Cycle Modeling	Systemwide	Systemwide	A	1
9303800	North Fork John Day Area Riparian Fencing	Lower Mid-Columbia	John Day	A	1
9304000	Fifteenmile Creek Habitat Restoration Project	Lower Mid-Columbia	Fifteenmile	A	1
9305600	Assessment of Captive Broodstock Technology	Systemwide	Systemwide	A	1
9306000	Evaluate Columbia River Select Area Fisheries	Lower Columbia	Lower Columbia	A	1
9306200	Salmon River Anadromous Fish Passage Enhancement	Lower Snake	Salmon	A	1
9306600	Oregon Fish Screening Project FY99 Proposal	Lower Mid-Columbia	John Day	A	1
9401001	Mitigation for Excessive Drawdowns at Hungry Horse &	Upper Columbia	Kootenai	R	1
9401002	Mitigation for Excessive Drawdowns: Hungry Horse	Upper Columbia	Flathead	R	1
9401200	Kootenai River Fisheries Investigation M&E	Upper Columbia	Kootenai	R	1
9401500	Idaho Fish Screening Improvement - O&M	Lower Snake	Salmon	A	1
9401700	Idaho Model Watershed Habitat Projects	Lower Snake	Salmon	A	1
9401805	Enhance Habitat For Spring Chinook, Summer Steelhead,	Lower Snake	Asotin	A	1
9401806	Enhance Habitat For Spring & Fall Chinook, Summer	Lower Snake	Tucannon	A	1
9401807	Enhance Habitat For Fall Chinook, Steelhead and	Lower Snake	Tucannon	A	1
9402600	Pacific Lamprey Research and Restoration	Systemwide	Systemwide	A	1
9402700	Grande Ronde Model Watershed Habitat Projects	Lower Snake	Grande Ronde	A	1
9403300	The Fish Passage Center	Systemwide	Systemwide	A	1
9403400	Assessing Summer & Fall Chinook Salmon Restoration in	Lower Snake	Clearwater	A	1
9403900	Wallowa Basin Project Planning	Lower Snake	Grande Ronde	A	1
9404200	Trout Creek Habitat Restoration Project	Lower Mid-Columbia	Deschutes	A	1
9404300	Monitor, Evaluate, and Research the Lake Roosevelt	Upper Columbia	Upper Columbia	R	1
9404700	Lake Pend Oreille Fishery Recovery Project	Upper Columbia	Pend Oreille	R	1
9404900	Improve the Kootenai River Ecosytem	Upper Columbia	Kootenai	R	1

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9405000	Salmon River Habitat Enhancement	Lower Snake	Salmon	A	1
9405300	Bull Trout Assessment - Willamette/Mckenzie	Lower Columbia	Willamette	R	1
9405400	Bull Trout Genetics, Habitat Needs, L.H. Etc. in Central	Lower Mid-Columbia	Deschutes, John Day,	R	1
9405900	Yakima Basin Environmental Education	Lower Mid-Columbia	Yakima	A	1
9406900	A Spawning Habitat Model to Aid Recovery Plans for	Lower Mid-Columbia	Lower Mid-Columbia	A	1
9500100	Kalispel Tribe Resident Fish	Upper Columbia	Pend Oreille	R	1
9500600	Shoshone-Bannock/Shoshone-Paiute Joint Culture	Upper Snake	Upper Snake	R	1
9500700	Hood River Production Program - PGE: O&M	Lower Mid-Columbia	Hood	A	1
9500900	Volunteers Rear 500,000 Net Pen Rainbow Trout Above	Upper Columbia	Upper Columbia	R	1
9501100	Chief Joseph Kokanee Enhancement Project	Upper Columbia	Upper Columbia	R	1
9501300	Nez Perce Trout Ponds	Lower Snake	Clearwater	R	1
9501500	Billy Shaw Wetlands catch and release fishery O&M	Upper Snake	Owyhee	R	1
9501600	Genetic Inventory of Westslope Cutthroat Trout, North	Lower Snake	Clearwater	R	1
9502500	Flathead River Instream Flow Project	Upper Columbia	Flathead	R	1
9502700	Assess Limiting Factors of the Lake Roosevelt White	Upper Columbia	Upper Columbia	R	2
9502800	Restore Moses Lake Recreational Fishery	Upper Mid-Columbia	Crab	R	1
9503300	O&M of Yakima Fish Protection, Mitigation &	Lower Mid-Columbia	Yakima	A	1
9505700	Southern Idaho Wildlife Mitigation	Upper Snake	Upper Snake	W	1
9506001	Enhance Squaw Creek Watershed for Anadromous Fish	Lower Mid-Columbia	Umatilla	W	1
9506300	Yakima/Klickitat Monitoring and Evaluation Program	Lower Mid-Columbia	Yakima	A	1
9506402	Upper Yakima Species Interactions Studies	Lower Mid-Columbia	Yakima	A	1
9506404	Policy/Technical Involvement & Planning for YKFP	Lower Mid-Columbia	Yakima	A	1
9506406	Monitor Supplementation Response Variable For the	Lower Mid-Columbia	Yakima	A	1
9506700	Coville Confederated Tribes Performance Contract	Upper Columbia	Upper Columbia	W	1
9506800	Klickitat Passage/Habitat Improvement M&E	Lower Mid-Columbia	Klickitat	A	1
9600500	Operate Independent Scientific Advisory Board	Systemwide	Systemwide	A	1
9600600	Path-Facilitation, Technical Assistance, and Peer Review	Systemwide	Systemwide	A	1
9600700	Irrigation Diversion Consolidations & Water	Lower Snake	Salmon	A	1
9600800	PATH-Participation by State and Tribal Agencies	Systemwide	Systemwide	A	1
9600801	Provide Scientific Input to the PATH Process	Systemwide	Systemwide	A	1
9601100	Screens and Traps on the Walla Walla and Touchet	Lower Mid-Columbia	Walla Walla	A	1
9601200	Adult Fish Passage Improvement - Walla Walla River	Lower Mid-Columbia	Walla Walla	A	1
9601700	Provide Technical Support in the Plan For Analyzing and	Systemwide	Systemwide	A	1
9601900	Second-Tier Database For Ecosystem Focus	Systemwide	Systemwide	A	3
9602100	Gas Bubble Disease Research & Monitoring of Juvenile	Mainstem	Mainstem	A	1
9603201	Begin Implementation of Year 1 of the K Pool Master Plan	Lower Mid-Columbia	Lower Mid-Columbia	A	1
9603301	Supplement and Enhance the Two Existing Stocks of	Lower Mid-Columbia	Yakima	A	1
9603302	Evaluate the Feasibillity and Potential Risks of Restoring	Lower Mid-Columbia	Yakima	A	1
9603501	Satus Watershed Restoration	Lower Mid-Columbia	Yakima	A	1
9604000	Evaluate the Feasibility and Risks of Coho	Upper Mid-Columbia	Methow	A	1
9604200	Restore and Enhance Anadromous Fisheries and Habitat	Upper Mid-Columbia	Okanogan	A	1
9604300	Johnson Creek Artificial Propagation Enhancement -	Lower Snake	Salmon	A	1
9604601	Walla Walla Basin Fish Habitat Enhancement	Lower Mid-Columbia	Walla Walla	A	1
9605300	North Fork John Day River Dredge Tailings Restoration	Lower Mid-Columbia	John Day	A	1
9606700	Manchester Spring Chinook Broodstock Project	Lower Snake	Salmon	A	1
9607000	McKenzie River Focus Watershed Coordination	Lower Columbia	Willamette	A	1
9607702	Protecting and Restoring the Lolo Creek Watershed	Lower Snake	Clearwater	A	1
9607703	Protecting and Restoring the Squaw and Papoose Creek	Lower Snake	Clearwater	A	1
9607704	Final Design for Fish Passage Improvements at Lower	Lower Snake	Clearwater	A	1
9607705	Restore Mccomas Meadows	Lower Snake	Clearwater	A	1

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9607706	Restore Lolo Watershed	Lower Snake	Clearwater	A	2
9607707	Restore Squaw and Papoose Watersheds	Lower Snake	Clearwater	A	2
9608000	Northeast Oregon Wildlife Mitigation Project	Lower Snake	Grande Ronde	W	1
9608300	Upper Grande Ronde Habitat Enhancement	Lower Snake	Grande Ronde	A	1
9608600	Clearwater Subbasin Focus Watershed Program	Lower Snake	Clearwater	A	1
9608701	Focus Watershed Coordination-Flathead River	Upper Columbia	Flathead	R	1
9608720	Focus Watershed Coordination-Kootenai River	Upper Columbia	Kootenai	R	1
9609400	Washington Department of Fish & Wildlife Habitat Units	Systemwide	Systemwide	W	1
9700100	Captive Rearing Initiative for Salmon River Chinook	Lower Snake	Salmon	A	1
9700200	PATH-UW Technical Support	Systemwide	Systemwide	A	1
9700300	Box Canyon Watershed Project	Upper Columbia	Pend Oreille	R	1
9700400	Resident Fish Stock Status Above Chief Joseph and	Upper Columbia	Pend Oreille,	R	1
9700900	Evaluate Means of Rebuilding White Sturgeon	Lower Snake	Lower Snake	R	1
9701000	PIT Tag System Transition	Mainstem	Mainstem	A	1
9701100	Enhance and Protect Habitat and Riparian Areas on Duck	Upper Snake	Owyhee	R	1
9701300	Operation & Maintenance For Upper Yakima River	Lower Mid-Columbia	Yakima	A	1
9701400	Evaluation of Juvenile Fall Chinook Stranding on the	Mainstem	Mainstem	A	1
9701900	Stinkingwater Salmonid Project	Upper Snake	Malheur	R	1
9702400	Avian Predation on Juvenile Salmonids in the Lower	Mainstem	Mainstem	A	1
9702500	Implement the Wallowa County/Nez Perce Tribe Salmon	Lower Snake	Grande Ronde	A	1
9702600	Identify Marine Fish Predators of Salmon and Estimate	Mainstem	Ocean/estuary	A	1
9703000	Monitor Listed Stock Adult Chinook Salmon Escapement	Lower Snake	Salmon	A	1
9703400	Monitor Fine Sediment and Overwinter Sedimentation in	Lower Mid-Columbia	John Day	A	1
9703800	Listed Stock Chinook Salmon Gamete Preservation	Lower Snake	Salmon	A	1
9704900	Teanaway River Instream Flow Restoration	Lower Mid-Columbia	Yakima	A	1
9705100	Yakima Basin Side Channels	Lower Mid-Columbia	Yakima	A	1
9705200	Enhancement Between Selah and Union Gaps	Lower Mid-Columbia	Yakima	A	2
9705300	Toppenish-Simcoe Instream Flow Restoration	Lower Mid-Columbia	Yakima	A	2
9705600	Lower Klickitat River Riparian & In-Channel Habitat	Lower Mid-Columbia	Klickitat	A	1
9705700	Salmon River Production Program	Lower Snake	Salmon	A	1
9705900	Securing Wildlife Mitigation Sites - Oregon	Systemwide	Systemwide	W	1
9705904	Securing Wildlife Mitigation Sites-Oregon, Horn Butte	Lower Columbia	Lower Columbia	W	1
9705905	Securing Wildlife Mitigation Sites-Oregon, Ladd Marsh	Lower Snake	Grande Ronde	W	1
9705906	Securing Wildlife Mitigation Sites-Oregon, McKenzie	Lower Columbia	Willamette	W	1
9705907	Securing Wildlife Mitigation Sites-Oregon, E.E. Wilson	Lower Columbia	Willamette	W	1
9705908	Securing Wildlife Mitigation Sites-Oregon, Multnomah	Lower Columbia	Willamette	W	1
9705909	Securing Wildlife Mitigation Sites-Oregon, Mitchell Point	Lower Columbia	Lower Columbia	W	1
9705910	Securing Wildlife Mitigation Sites-Oregon, Trout Creek	Lower Mid-Columbia	Deschutes	W	1
9705911	Securing Wildlife Mitigation Sites-Oregon, Irrigon WMA	Upper Columbia	Upper Columbia	W	1
9705912	Securing Wildlife Mitigation Sites-Oregon, Wenaha	Lower Snake	Grande Ronde	W	1
9705913	Securing Wildlife Mitigation Sites-Oregon, South Fork	Lower Mid-Columbia	Deschutes	W	1
9705915	Juniper Canyon and Columbia Gorge Wildlife Mitigation	Lower Mid-Columbia	Lower Mid-Columbia	W	1
9705916	Tualatin River National Wildlife Refuge Additions	Lower Columbia	Willamette	W	1
9706000	Clearwater Subbasin Focus Watershed Program	Lower Snake	Clearwater	A	1
9706200	Development /Refinement of Natural Production	Lower Mid-Columbia	Yakima	A	1
9800100	Analytical Support-PATH and ESA Biological	Systemwide	Systemwide	A	1
9800200	Snake River Native Salmonid Assessment	Upper Snake	Upper Snake, Boise,	R	1
9800300	O & M Funding of Wildlife Habitat on STOI Reservation	Upper Columbia	Upper Columbia	W	1
9800702	Grande Ronde Supplementation - O&M/M&E - Nez Perce	Lower Snake	Grande Ronde	A	1
9800703	Conduct Satellite Facility O&M and Program M&E for	Lower Snake	Grande Ronde	A	1

ID	Title	Subregion	Subbasin	Caucus*	Tier
9801001	Grande Ronde Basin Spring Chinook Captive Broodstock	Lower Snake	Grande Ronde	A	1
9801002	Captive Rearing Initiative for Salmon River Chinook	Lower Snake	Salmon	A	1
9801003	Monitor and Evaluate the Spawning Distribution of	Lower Snake	Lower Snake	A	1
9801004	Monitor and Evaluate Yearling Snake R Fall Chinook	Lower Snake	Lower Snake	A	1
9801005	Pittsburg Landing, Capt. John Rapids, Big Canyon Fall	Lower Snake	Lower Snake	A	1
9801006	Captive Broodstock Artificial Propagation	Lower Snake	Grande Ronde	A	1
9808001	PIT Tag Purchase and Distribution	Systemwide	Systemwide	A	1

C. Programmatic Summary Graphs

1. Summary by program area

Figures 5-8 describe the CBFWA recommendations across program area and program emphasis by contrasting the relative allocation of funds between the BPA Project Solicitation and the CBFWA recommendation. Figure 6 shows that 34% of the CBFWA recommended budget is allocated to anadromous fish production, 12% each to anadromous fish habitat, resident fish and wildlife, and the remaining divided between mainstem, basinwide and tributary projects as well as BPA/ISRP.

2. Summary by program emphasis

Figure 8 illustrates how CBFWA recommends allocating the budget by Program Emphasis. Slightly over 75% of the budget is relatively evenly divided between anadromous fish construction, monitoring and evaluation and research and resident fish and wildlife. The remaining budget covers other program elements such as coordination, predation, law enforcement, and operations and maintenance.

3. Summary by CBFWA vs. non-CBFWA

Figure 9 describes the distribution of funds between CBFWA members and non CBFWA members for the BPA project solicitation and the final CBFWA Recommendation. The greater proportion of non-CBFWA members responding to BPA's project solicitation reflects the increasing interest by non-CBFWA members in program participation.

Figure 5. BPA Project Solicitation by Program Area

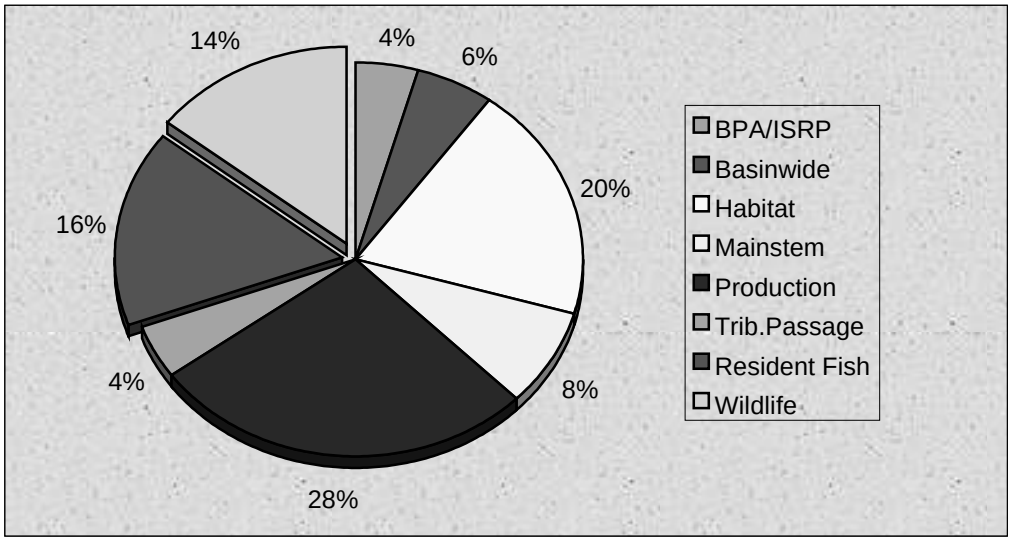


Figure 6. CBFWA Recommendation by Program Area

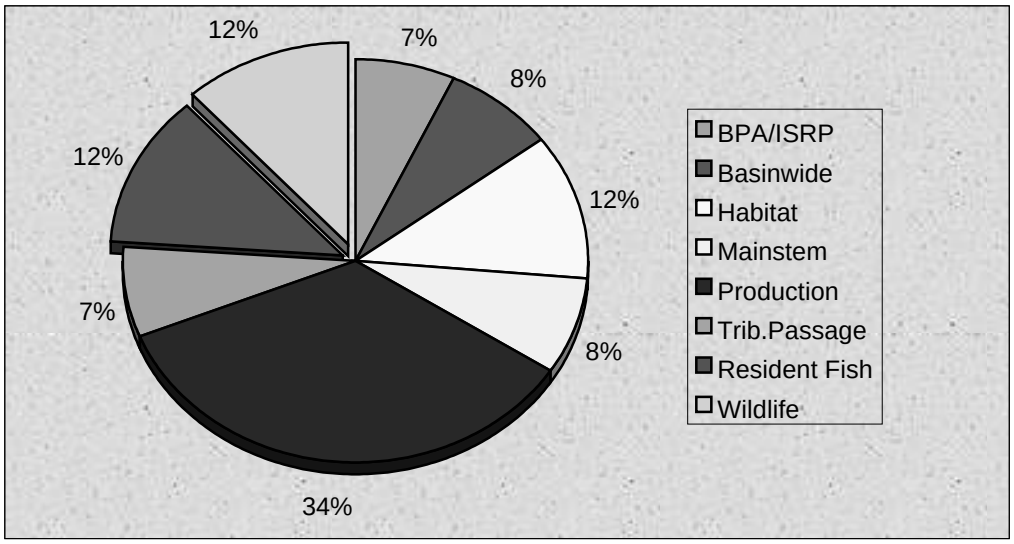


Figure 7. BPA Project Solicitation by Program Emphasis

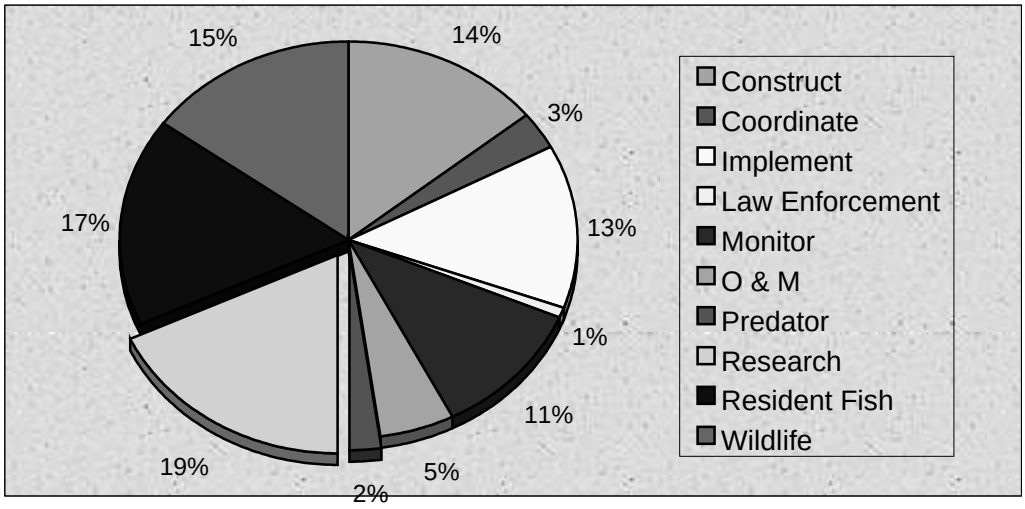


Figure 8. CBFWA Recommendation by Program Emphasis

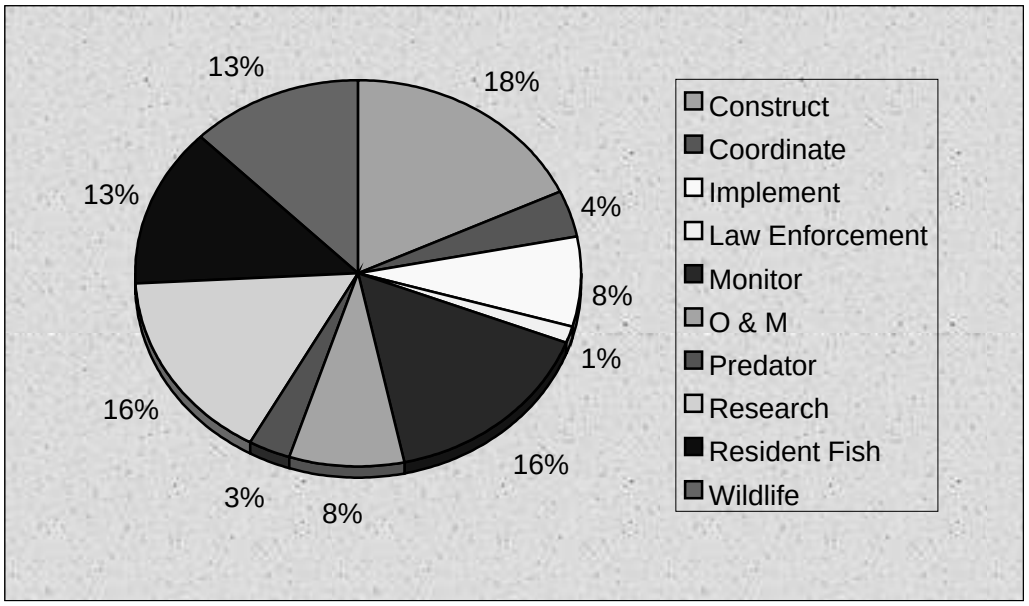
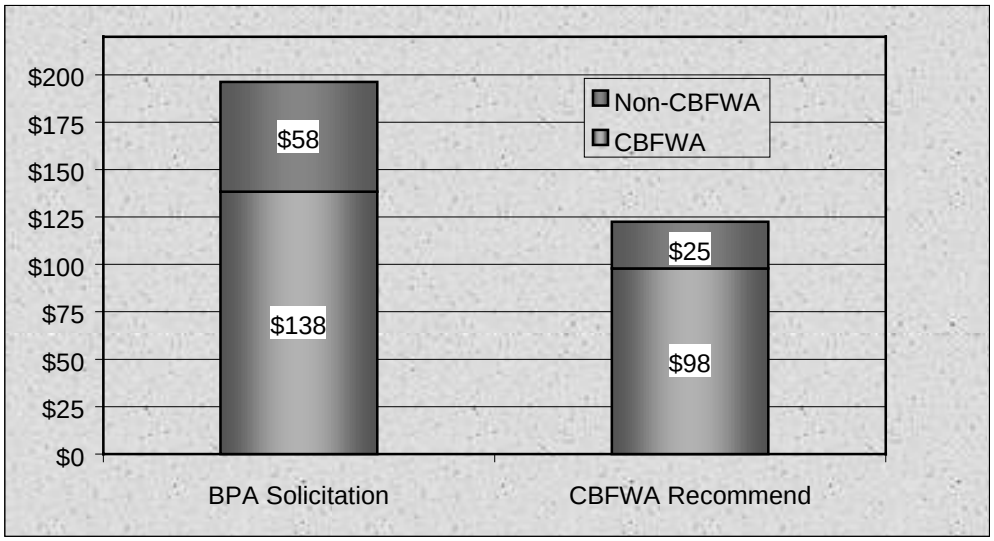


Figure 9. Funding by CBFWA Membership Status



IV. Regional Recommendations

The managers' proposed framework for fish and wildlife recovery starts with a basinwide goal and principles which guide fish and wildlife management. Sub-goals and regional objectives for anadromous and resident fish and wildlife are tiered from the goal and provide more specific guidance. This framework includes information gleaned from the Council's Fish and Wildlife Program, Proposed Recovery Plan and Biological Opinions for Endangered Species, Wy-Kan-Ush-Mi Wa-Kish-Wit, and other tribal, state and federal plans and policies. It also responds to the points raised by the Independent Scientific Group in its report, "Return to the River." This section outlines goals and principles, and general strategies to accomplish the goals. More detailed objectives and strategies for each subregion and/or subbasin are outlined in Section V.

A. The Goal for Columbia Basin Fish and Wildlife Restoration

> Restore sustainable, naturally producing fish and wildlife populations to support tribal and non-tribal harvest and cultural and economic practices. This goal will be achieved by restoring the biological integrity and the genetic diversity of the Columbia River ecosystem and through other measures that are compatible with naturally producing fish and wildlife populations. This goal is intended to fulfill the nation's and the region's obligations under treaties and executive orders with Northwest Indian tribes, treaties with Canada, and applicable resource protection, restoration and enhancement statutes and regulations.

1. Regional Principles

General Principle: The scientific foundation of the fish and wildlife managers' Multi-Year Plan views ecosystems as dynamic networks of natural and human factors. While the Columbia River ecosystem can be described and studied, it is a constantly moving target, and opportunities for prediction and manipulation are limited. It is prudent to understand and utilize the natural physical and biological processes that create and maintain productive ecosystems. Species reflect their associated landscapes and ecosystems. Hence, the condition and abundance of desired species reflect the condition of the ecosystem. Technology should support and foster needed ecosystem attributes.

Specific Principles: This general principle is consistent with three principles identified by the Independent Scientific Group. Fish and wildlife managers have added specific references to resident fish and wildlife to the ISG principles.

- Restoration of Columbia River fish and wildlife resources must address the entire natural and cultural ecosystem including upland, riparian, freshwater, estuarine and ocean habitats where appropriate. This consideration includes human developments, as well as natural habitats.

- Sustained natural productivity requires a network of complex and interconnected habitats, which are created, altered and maintained by natural physical processes in uplands, riparian, freshwater, the estuary and the ocean. These diverse and high-quality habitats are crucial for reproduction, rearing, migration, maintenance of food webs and predator avoidance.

- Life history diversity, genetic diversity and meta-population organization are ways fish and wildlife populations adapt to their complex and connected habitats. This bio-diversity and its organization contribute to the ability of fish and wildlife populations to cope with the environmental variation that is typical of terrestrial, freshwater, and saltwater environments.

The members of the Columbia Basin Fish and Wildlife Authority agree with these basic tenets of the ISG and have incorporated them into their plan. The fish and wildlife managers have identified three additional principles which they believe are important for restoration activities.

- Salmonid species can function as keystone populations throughout their historic range. For example, the decay of large numbers of salmon carcasses effectively cycle nutrients from the ocean to freshwater ecosystems. Salmon probably had a key role in physically structuring the environment and providing an appreciable food base for terrestrial species. It is important to re-establish the nutrient cycle in those areas still accessible to salmon. The loss of that nutrient cycling in those areas now blocked to anadromous fish must be adjusted for when developing restoration plans.

- Restoration of fish and wildlife resources depends upon managing human impacts to achieve ecosystem conditions that allow natural development of suitable ecosystem functions. Suitable ecosystem conditions can be achieved by managing human impacts to allow natural development of needed characteristics. Technology should be used to foster the development of suitable conditions rather than replace natural functions.

- Salmonids, and other species, can function as indicator species to define desired environmental conditions. In those subbasins still accessible to anadromous fish, salmon are a suitable yardstick for defining normative conditions. In this sense the needs of salmon also describe the majority of needs of a particular assemblage of other native species which, historically, occupied the same freshwater habitat. In areas blocked to anadromous fish, other sensitive native fish and wildlife species such as Kootenai River white sturgeon, bull trout, and bald eagles can serve as indicators of ecosystem condition. We should strive to re-establish and maintain the bio-diversity represented by these historically co-evolved native fish and wildlife species assemblages.

2. Regional Anadromous Fish Objectives

The Anadromous Fish Managers have chosen some regional objectives, including:

- By 2005, implement actions sufficient to halt the declining trend in salmon and steelhead populations above Bonneville Dam.

- Restore healthy, naturally reproducing populations of salmon in each subregion accessible to salmon. Healthy populations are defined as having an 80 percent probability of maintaining themselves for 200 years at a level that can support harvest rates of at least 30 percent.

- By 2001, obtain the information necessary to manage and restore Pacific lamprey.

- By 2025, increase the total adult salmon and steelhead returns above Bonneville Dam to 5 million annually in a manner that supports tribal and non-tribal harvest.

- Fully mitigate for losses of anadromous fish, resident fish and wildlife within 200 years.

3. Resident Fish Sub-Goals and Objectives

The Resident Fish Managers have chosen several sub-goals and objectives to guide resident fish management, including:

- Mitigation efforts to address resident fish losses due to human caused impacts, including the construction and operation of the hydrosystem.

- Resident fish substitution efforts to address the loss of salmon and steelhead in those areas permanently blocked to anadromous fish as a result of the construction and operation of hydroelectric dams.

- Mitigate and compensate for resident and anadromous fish losses caused by the construction and operation of federally-operated and federally-regulated hydro-power projects.

- Ensure the continued persistence, health, and diversity of existing resident fish species by reducing or removing impacts caused by habitat degradation (including water quality, water quantity, and hydropower development), competition and/or hybridization with non-native species, and over-harvest (direct and incidental).

- Restore native resident fish species (subspecies, stocks and populations) to near historic abundance throughout their historic ranges where habitats exist and where habitats can be feasibly restored.

- Maintain and restore healthy ecosystems and watersheds which preserve functional links among biota to ensure the continued persistence, health and diversity of all species including game fish species, non-game fish species, and other organisms.

- Administer and increase opportunities for consumptive and non-consumptive resident fisheries for native, introduced, wild, and hatchery-reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance (includes intensive fisheries within closed or isolated systems).

4. Wildlife Sub-Goal and Objectives

The wildlife sub-goal is to achieve and sustain levels of habitat and species productivity in order to fully mitigate for the wildlife losses that have resulted from the construction and operation of the federal and nonfederal hydroelectric system in the Columbia River Basin.

- Develop mitigation plans that will fully mitigate for wildlife losses.

- Coordinate efforts within the Columbia Basin.

- Ensure that trust/settlement agreements and other mitigation programs demonstrate consistency with mitigation goals, objectives, and methods.

- Track mitigation goals and the gains in habitat units (HU) as a result of implemented mitigation plans.

- Ensure consistent application of Habitat Evaluation Process (HEP) methodology. Ensure baseline HEP estimates are completed as projects come on line.

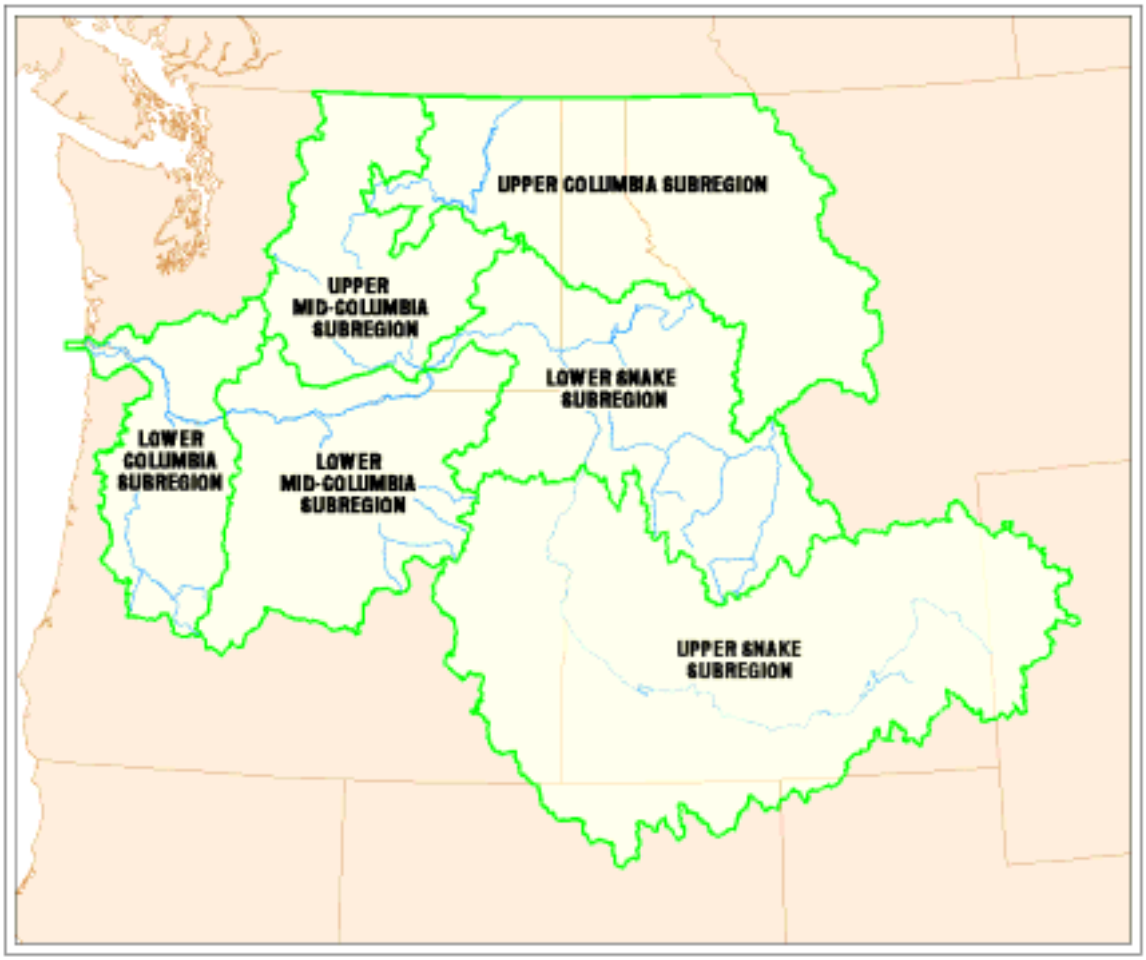
- Conduct operational loss assessments.

- Develop a monitoring and evaluation plan that measures habitat and species response to management actions.

- Develop policy regarding substitution of habitat types.

V. Subregion Summaries

A. System Wide



System wide projects refer to ones that potentially affect the entire Columbia River Basin or ones that assist in coordination of activities basin wide. The Columbia River is one of the larger rivers in the world and its drainage basin covers over 220,000 square miles in the United States alone.

The primary anadromous fish species targeted for active system wide management throughout the Columbia River Basin include salmon (spring, summer, and fall chinook, coho, chum, sockeye), winter and summer steelhead, Pacific lamprey, and white sturgeon.

Two goals capture the management intent for these populations: 1) restore sustainable, naturally producing anadromous fish populations to support tribal and non-tribal harvest and cultural and economic practices; and, 2) restore the biological integrity and the

genetic diversity of the Columbia River ecosystem compatible with naturally producing fish and wildlife populations.

These goals have been further defined by the following management objective: to make timely, effective, and informed decisions regarding management of Columbia River anadromous fish. The regional co-managers' statutory authority for management of Columbia River anadromous fish resources includes the responsibility of establishing goals and objectives, developing strategies for achieving those objectives, and prioritizing necessary recovery and enhancement actions. The co-managers also are responsible for decisions regarding the allocation of available financial and human resources to implementation and management tasks. Two key aspects of management of Columbia River anadromous fish resources are 1) information management and 2) coordination of activities. Effective management requires that an infrastructure which supports the collection, analysis, and dissemination of information (data), and that promotes coordination among sovereign entities be established and maintained.

To achieve the system wide management objective, fish managers have defined several strategies:

1) Set goals, objectives and strategies for fish and wildlife management and coordinate planning and implementation.

This strategy uses the existing processes to facilitate the communication and coordination necessary for planning and implementation on a basin-wide basis. These processes include those of the Columbia Basin Fish and Wildlife Authority, the Regional Forum (Biological Opinion implementation), and the Columbia River Fish Management Plan (harvest and production). These processes and their technical subcommittees provide much of the infrastructure necessary to coordinate biological and technical research, develop monitoring programs, identify priority needs, and allocate funding from a basin-wide perspective. These forums have grown exponentially in the past few years, and the CBFWA members have proposed increased funding in order to more effectively participate in these regional planning and implementation processes, as described in the CBFWA project description (project #8906200).

Coordinated management of Columbia River anadromous fish requires that program-level managers within the agencies and tribes be supported by staff dedicated to necessary regional activities. The two main regional support staffs are: the Fish Passage Center (#9403300) which monitors smolt migrations, analyzes fisheries and hydrological data, and interfaces with the operating agencies on hydroelectric operations; and, the Columbia Basin Fish and Wildlife Authority (#8906200) which provides logistical and analytical support for coordination, budget tracking, project prioritization, planning, and project implementation. Through CBWFA, the fish and wildlife managers develop the Annual Implementation Work Plan which reflects specific activities that are necessary to achieve certain goals and objectives and are consistent with agreed upon strategies to achieve them. These objectives integrate the requirements of the NPPC's Columbia River Basin Fish and Wildlife Program, the NMFS's 1995 Biological Opinion on

Hydropower Operations (as amended in 1998 for listed steelhead), and Wy-Kan-Ush-Mi Wa-Kish-Wit. The co-managers engage in a rigorous review and priority-setting process, using the facilities and staff of the CBFWA

A project titled "Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Now" (#9132) provides support for implementation of the Tribal Restoration Plan and watershed project selection process.

2) Provide a peer review capability.

The Northwest Power Act (Power Act) requires that the Columbia River Fish and Wildlife Program be based on the "best available science." A 1997 amendment to the Power Act established the Independent Scientific Review Panel, to provide recommendations on the scientific basis for the Program and its implementation. The Endangered Species Act has a parallel requirement. A number of efforts are necessary to define critical scientific uncertainties, develop a unified scientific framework for the Columbia Basin, and provide for independent scientific review of plans and programs. These efforts are funded under project #9600500.

3) Conduct regional research and monitor progress and results.

Because of their scope, a number of research, monitoring, and implementation activities have basin-wide implications and require joint coordination by the co-managers. Several pieces are included here: production (captive broodstock and supplementation activities), fish marking for research and monitoring, and research directed at providing broad regional application.

The Captive Broodstock Assessment (#9305600) provides information on the effectiveness of captive broodstock programs and to assist with setting objectives for individual captive broodstock implementation programs. Performance/Stock Production Impacts of Hatchery Supplementation, (#9005200) will provide continuing information to assist supplementation activities. The Coded Wire Tag program (projects #8201300, #8906500, #8906600, #8906900) provides information on contribution of various stocks of hatchery fish to fisheries and for use in estimating survival; and permits assessment of straying and potential interaction with wild stocks. Project #8331900 is providing useful information on improved tagging techniques that will reduce handling mortality and facilitate marking larger numbers of fish at less cost. Project #9808001 provides a placeholder for PIT tag purchases, so that individual project PIT tag needs can be transferred to one contract for cost-effective purchase, tracking, and distribution. Broader research activities include Evaluate Fall Chinook and Chum Spawning, Production and Habitat Use in the Columbia River (#9131), Spring Chinook Salmon Early Life History (#9202604) and Pacific Lamprey Research and Restoration (#9402600).

The co-managers will continuously revisit current and planned activities in these areas to insure that they are providing useful information.

4) Develop tools and models needed to enhance decision-making ability.

Activities include those associated with PATH, the Plan for Analyzing and Testing Hypothesis, which is assessing historical data and prospectively analyzing alternative Columbia River system configurations and operating scenarios to determine which course(s) can lead to recovery of listed and weak stocks. Projects #9600800, 9600801, and 9600600 provide direct support to the fish and wildlife managers for these activities, while projects #9303701, 9007800, 9203200, 9601700, 9700200 and 9800100 provide funding for technical support from the University of Washington and other work used primarily by non-fish managers.

5) Manage information (maintain and disseminate data) and report results to constituents and stakeholders.

The managers support the need to report results and progress routinely and to make information available to stakeholders and the public. The StreamNet project (#8810804) collects data by watershed and species throughout the Columbia River Basin and makes it available on the Internet. StreamNet consolidates data compilation and management activities that were historically conducted through the "Coordinated Information System" and the "Northwest Environmental Data Base." Still under development, this project creates, maintains, and enhances a high quality, regionally consistent set of data on fish and related aquatic resources. Services are targeted to meet specific Fish and Wildlife Program needs.

The suite of projects categorized as system wide are fundamental to making broad regional decisions and implementing specific activities for anadromous fish management, recovery, and protection on a daily, weekly, annual, and longer term time-frame.

The Systemwide projects addressing Wildlife in more than one subregion. The Wildlife Program goals, objectives, and strategies for the Systemwide subregion are consistent with the overall wildlife program goals outlined in Section IV above. Two ongoing, coordinated implementation efforts in the CBFWA Wildlife Caucus span subregions: the Washington Interim Agreement and the Oregon Wildlife Coalition.

Washington Interim Agreement

Wildlife managers in the State of Washington reached an interim agreement with Bonneville in April 1993 for $45.5 million. The managers divided mitigation responsibility for the hydroprojects in the state and implemented projects over a five-year period. In 1996, the Washington Department of Fish and Wildlife (WDFW) agreed to receive its share of the funds over a longer period of time. Ongoing project #9609400 is the FY 1999 portion due to WDFW under its Washington Interim Agreement allocation. The Washington Interim Agreement is almost fully implemented and provides an estimated 132,940 habitat units. Other projects funded under the agreement are noted in their appropriate subregions. Individual WDFW projects are located in the Upper Columbia, Upper Mid-Columbia, and Lower Mid-Columbia subregions.

Oregon Wildlife Coalition

The Oregon Wildlife Managers have used GAP Analysis to plan and prioritize potential wildlife acquisitions and enhancements in the State of Oregon. FY 1999 marks the first year of full-scale implementation based on their prioritization. For detailed information, see the project description for "umbrella project" #9705900 and the individual project descriptions funded under the umbrella.

B. Columbia and Snake River Mainstem

Projects that target activities solely in the mainstem Columbia or Snake rivers are grouped here. These projects typically deal with fish passage issues, predators, or water quality issues in these areas.

The primary anadromous fish species targeted for mainstem management throughout the Columbia River Basin include salmon (spring, summer, and fall chinook, coho, chum, sockeye), winter and summer steelhead, Pacific lamprey, and white sturgeon.

The goals for these populations are: restore sustainable, naturally producing anadromous fish populations to support tribal and non-tribal harvest and cultural and economic practices; and, restore the biological integrity and the genetic diversity of the Columbia River ecosystem compatible with naturally producing fish and wildlife populations.

The resource conditions in the mainstem Columbia and Snake rivers result in critical limiting factors to anadromous fish, such as direct juvenile fish mortalities from passing through dam turbines, increased vulnerability to predators, and juvenile and adult fish

passage delays at and between the dams. With the exception of the tidewater area from the mouth of the Columbia to Bonneville Dam and the 50 miles of free-flowing river from Priest Rapids Dam to the head of McNary Dam Pool, the mainstem Columbia and Snake rivers have been converted to a series of 14 dams and reservoirs that present both a physical obstacle and altered hydraulic conditions that impact anadromous fish passage. Also, the operation of headwater storage dams for flood control, irrigation, and power production has substantially altered the natural hydrograph of the river, including the estuary and near ocean environments. This headwater storage capability has resulted in water being stored during the normal spring freshet for release during times when the demand for hydropower is greater and there is no longer any danger from flooding. The increase in cross-sectional area of the river caused by the reservoirs has greatly slowed water velocity, contributed to raised water temperatures, and has converted the riverine environment with its seasonal freshets, cooler water and high turbidities to a reservoir environment with low velocities, and warmer and relatively clear water.

The following management objectives are defined to assist in meeting the goals:

- Maximize survival of juvenile and adult anadromous fish as they migrate through the mainstem Columbia and Snake rivers
- Protect and improve spawning, incubation, and rearing of anadromous fish in the mainstem Columbia River
- Improve survival of anadromous fish in the Columbia River estuary and near-ocean plume
- Utilize supplementation to increase natural production in the mainstem
- Use hatchery releases to augment harvest in the mainstem and ocean.
- Research, monitor and evaluate activities.

To achieve the mainstem management objectives, fish managers have defined several strategies:

1) Reduce mortalities of juvenile and adult anadromous fish caused by passage by the projects of the Federal Columbia River Power System and passage through the reservoirs and mainstem reaches between natal streams and the estuary (Objective 1).

    - reduce predation through actions such as harvest of Northern Pikeminnow and harassment and control of fish-eating birds and marine mammals (projects #9007700 and #9702400) and project #9702600 (large marine fish predators);

    - reduce illegal harvest through increased law enforcement (project #9202401);

    - maintain in-river harvest at levels compatible with protection and enhancement (project #9306000 is evaluating methods to reduce the impact of mixed-stock harvest in the mainstem Columbia River through the development of terminal fishing opportunities at off-channel locations, compatible with protection and enhancement of weak stocks); and,

- manage hatchery fish to minimize negative interactions with wild and naturally produced fish. The NPPC Comprehensive Review of Artificial Production is funded with FY 1998 funds, and the CBFWA was advised by the NPPC staff that additional FY 1999 funds are not needed although the review will not be complete until 1999. Producing a more wild-like hatchery fish that migrates downstream rapidly, survives at a higher rate, and has minimal impact on naturally-produced smolts is an important strategy. Project #9202200 is testing the physiological aspects of wild fish that may be used to improve the migration behavior and smolt-to-adult survival of hatchery reared salmonids.

2) Protect and improve mainstem habitats necessary for spawning, incubation, and rearing in the Columbia River. Specific actions being implemented to address Objective 2 include:

- improve flow conditions and operations, including maximizing the amount of wetted areas, minimizing effects of peaking, ramping, and changes in flows, regulating in-water work such as dredging and construction, and providing the appropriate water quality, quantity and temperatures. The collection, analysis, storage of information, and dissemination of real time data on juvenile and adult fish migration through the mainstem Snake and Columbia rivers (passage timing and duration, mark recaptures, development of passage indices, travel time etc.) are essential for management of flow, spill, and project operations designed to maximize juvenile and adult survival. The Smolt Monitoring Program (SMP) provides most of this information through Smolt Monitoring at Federal Dams (#8401400) and Smolt Monitoring by Non-Federal Entities (#8712700). Project #8332300 provides for the capture and PIT Tag marking of chinook and steelhead at Whitebird and Lewiston traps for travel time, minimum survival, and the passage distribution of specific mark groups. Part of project #8906500 provides for the marking of specific SMP mark groups. The Comparative Survival Study (#8712702, replaces old #9602000) is the fourth year of a long term PIT tag study to develop smolt-to-adult survival indices for spring and summer stream type chinook originating above Lower Granite Dam to evaluate smolt migration mitigation measures and actions (such as flow augmentation, spill, and transportation) for the recovery of listed salmon stocks. The Fish Passage Center (FPC), #9403300, plays an important role in coordinating the SMP and in analyzing, storing, and disseminating fish passage and migration data for in-season management of flow and spill. The FPC maintains a real time database for management purposes, a home page for data distribution, and provides weekly and annual reports. The Columbia Basin PIT Tag Information System (# 9008000), in addition to operations and maintenance support to the current PIT Tag system, provides database and data system support for PIT Tag information for in-season and post season analysis and serves as a focal point for communication of technical and PIT Tag system related information. Project #9117 will provide facilitation services for the

regional forum that provides a technical and policy process for making mainstem river operations decisions.

Two projects will be completed in FY 99 to address questions raised about whether the data collected at the dams by the SMP (through projects #8712700 and #8401400) on the prevalence and severity of GBT are representative of the levels in fish in-river and at terminal areas (projects #9300802 and #9602100). Project #9602100 will also conduct experiments to assess the progression of GBT signs in juvenile salmonids, and determine the horizontal and vertical distribution and exposure histories of radio-tagged juvenile salmonids. The Comprehensive Gas Supersaturation Research Plan will be presented to the Council in June, 1998 and will describe the critical gas saturation research, management and abatement needs beyond FY 1999.

Preliminary results of work on the Hanford Reach of the Columbia River (#9406900) indicate that simple descriptors of habitat do not adequately describe the amount of fall chinook spawning that occurs in the Hanford Reach. Other descriptors such as sub-surface flow appear to be critical for determining habitat that provides for successful reproduction.

- Develop and implement actions to release and acclimate juvenile fish in areas and in ways that encourage returns to and spawning in mainstem habitats. Project #9603201 is recommended for funding for the Pacific lamprey objectives.

- Screen mainstem irrigation pump intakes.

3) Implement or determine the feasibility of the following specific actions to improve survival in the estuary and near-ocean plume (Objective 3)

- Manage river flows to improve the size, water quality, and water temperature of the Columbia River estuary and plume.

- Manage river flows to ensure juvenile fish arrive at the estuary at times and in the physical condition necessary to survive the transition from the freshwater to marine environment.

- reduce predation of juvenile and adult fish through actions such as harassment and control of fish-eating birds and marine mammals

- Protect, restore, and improve estuarine habitats such as marshes, tidal flats, etc.

- Reduce competition between exotics such as American shad and native juvenile and adult fish.

- Maintain in-river harvest at levels compatible with protection and enhancement.
- Manage hatchery fish to minimize negative interactions with wild and naturally produced fish.

4) Two projects are recommended for funding out of the ESA-Reserve account. Project #9063 will characterize, over a 10-year period, the physical and biological features of the nearshore ocean environment with real-time and modeling projections of the Columbia River plume as it interacts with the coastal circulation regime, and to relate these features, both spatially and temporally, to variation in salmon health, condition, and survival. Project #9702600 will estimate large marine fish predator (hakle and mackerel) abundance off the mouth of the Columbia River, and determine their feeding habits and their role as a potential source of mortality of juvenile salmon. In addition to collecting predators, the project will monitor selected oceanographic conditions (salinity, temperature, and chlorophyll a) to begin to describe the environmental factors associated with high rates of predation.

5) Use hatchery releases to supplement natural production (Objective 4).

Project #9603201 funds the YIN to develop a master plan and to construct, operate, and evaluate the lamprey production potential in the lower mid-Columbia River mainstem. Priest Rapids hatchery (funded by Grant PUD under FERC license requirements) releases URB juveniles above the Hanford Reach spawning areas to increase harvest opportunities and to increase numbers of spawners.

6) Use hatchery releases to augment harvest (Objective 5).

Numerous hatcheries release salmon near the mainstem Columbia to augment harvest in the river and in the ocean. These hatcheries are funded under the Corps' O/M (MOA – Reimbursable Budget) and Mitchell Act Hatcheries. Project #9202200 assesses the physiological parameters that indicate improvements to hatchery practices to minimize adverse impacts to wild stocks and to encourage mimicking those wild stocks.

7) Research, monitoring and evaluation activities are conducted to determine what other actions may contribute to efforts to reduce project and reservoir mortality, to document the results of actions being implemented, and to evaluate how actions individually and collectively are contributing to progress toward meeting the objective of maximizing survival of juvenile and adult anadromous fish as they migrate through the mainstem Columbia and Snake rivers.

- Develop the tools and install, operate and maintain the equipment necessary for conducting critical fish passage research and monitoring and evaluation activities in the mainstem. Recently steps have been taken to develop a new PIT Tag interrogation system based on the new, international standard for identification of animals as defined by the International Standards Organization. The current plan was to have this new system in place by 1999

and to have it meet or exceed the performance of the existing system as measured by tag reading efficiency, tag read range and speed, and tag size. The estimated cost of the installation in FY 98 and FY 99 is $4.75 million (Essential M&E Infrastructure - PIT Tag Monitor Procurement & Installation, # 9701000).

- Conduct essential monitoring and evaluation of juvenile and adult salmonids migrating through the mainstem, utilize the information for real-time management of flow, spill, and project operations, and maintain essential information in databases. Projects that are described under Objective 2.a. all provide this type of information (#'s 8401400, 8712700, 8332300, 8906500, 9403300, 9008000, 9117, 9300802, 9602100, and 9406900). Accurate estimation of survival of juvenile salmonids through the Snake and Columbia rivers is a key component to management and long-term decision-making by the Managers. The Statistical Support for Salmonid Survival Studies (#8910700) will improve the statistical models and software for expanded survival experiments.

- Evaluate the impact of predation and predator removal, flow augmentation, spill, fish condition, fish health, transportation, and other parameters of anadromous fish survival. Evaluation of various activities to improve survival of juvenile and adult anadromous fish as they migrate through the mainstem Columbia and Snake rivers is essential for documenting the results of actions being implemented and for determining how they individually and collectively are contributing to meeting the objective of maximizing survival. Projects #9007800, #9702600, and #9702400, and the monitoring and evaluation components of #9007700 are assessing the impacts of predation by marine fish, fish eating birds and northern pikeminnow. Survival estimates for yearling chinook, sub-yearling chinook, and steelhead through the Snake River will be developed through project #9302900. Project #8740100 will provide physiological data for the fish used for the survival estimates to determine the significance of fish condition at time of release and during migration.

BPA and the Corps of Engineers are cost sharing tracking of adult salmonids and lamprey outfitted with radio transmitters to evaluate their migration and to develop recommendations for adult passage improvements. In FY 98 the BPA contribution (#9204101) was to support analysis of data collected in 1996 and 1997 and no tracking was planned. However, tracking occurred in 1998 and is planned again for the last time in 1999 with final data analysis in 2000.

Several projects study life-history characteristics and their relationship to environmental conditions, including #9102900 (Life History and Survival of Fall Chinook Salmon in the Columbia River Basin), #9701400 (Evaluation of Juvenile Fall Chinook Stranding on the Hanford Reach) and #9406900 (A Spawning Habitat Model to Aid Recovery Plans for Snake River Fall Chinook). Project #9009300 provides information to monitor the

change or loss of genetic biodiversity among O. nerka populations throughout the Columbia Basin and in particular, Redfish Lake, Idaho.

- Identify limiting factors for restoring other native anadromous fish populations and recommend actions for restoration. Several projects are directed at determining lamprey recovery actions: project #9402600 (Pacific Lamprey Research and Restoration), #9057 (Evaluate Status of Pacific Lamprey in the Clearwater River Drainage, Idaho), #9603201 (Begin Implementation of Year 1 of the K Pool Master Plan Program), and #9104 (Conduct Baseline Habitat and Population Dynamics Studies on Lampreys in Cedar Creek).

The suite of projects categorized in the mainstem are fundamental in providing the best available information for making broad regional decisions and implementing specific activities for anadromous fish management, recovery, and protection on a daily, weekly, annual, and longer term time-frame. This critical information can then be used to make timely, effective, and informed river operations and system configuration decisions.

C. Lower Columbia Subregion

The Lower Columbia Subregion is defined as the Columbia River and its tributaries from the mouth of the Columbia to Bonneville Dam. This subregion covers approximately 17,700 square miles and includes the following subbasins: Lower Columbia Mainstem, Grays, Elochoman, Cowlitz, Kalama, Lewis, Willamette, Washougal, and Sandy.

The Anadromous Fish Managers are refining objectives, strategies and actions for the Lower Columbia Subregion. This report does not summarize subbasins in the Elochoman, Cowlitz, Kalama, Lewis, Washougal, and Sandy Rivers. The goals, resource conditions, objectives, strategies and actions for the Lower Columbia Mainstem are the same as the Columbia and Snake River Mainstem, and that description is found in Section V. (Subregion Summaries), Part B. (Columbia and Snake River mainstem). The summary of the Willamette Subbasin includes anadromous fish objectives, strategies and actions.

The Resident Fish Managers have two broad objectives for the Lower Columbia Subregion: 1) to maintain and restore population productivity reduced by hydropower development and operations to healthy levels which provide opportunities for consumptive and non-

consumptive uses of native populations or other species whose use is constrained by the sensitive populations; and, 2) to ensure population levels of native fish in Subbasin tributaries are above minimum viable population sizes which maintain adaptability and genetic diversity, and maximize probability of survival. Mitigation actions focus on primarily on bull trout genetics, habitat needs and life history in the Willamette and McKenzie Rivers and on white sturgeon in the mainstem (described under the Lower Mid-Columbia Subbasin).

The specific wildlife mitigation goal for the Lower Columbia River subregion is to fully mitigate for the wildlife losses caused by the construction and operation of the hydroelectric projects located in the subregion. For wildlife, the goals and objectives are described at the subregion level and apply to all of the subbasins within the subregion. This information is not repeated for each pertinent subbasin where wildlife projects occur. These hydro projects are listed below, with the estimated losses due to hydropower construction and habitat mitigation priorities as listed in the NPPC's Fish and Wildlife Program.

Lower Columbia Subregion HU Losses by Hydro Project	
Hydro Project	**HU loss**
Bonneville	12,317
Cougar	11,124
Hills Creek	19,489
Lookout Point	25,078
Dexter	6,648
Detroit	11,329
Big Cliff	413
Green Peter	16,432
Foster	3,544
Total	**106,374**

Lower Columbia Subregion Wildlife Mitigation Priorities	
Habitat Type	**Priority**
Riparian/Riverine	High
Old Growth Forest	High
Wetlands	High
Coniferous Forest	Medium

The wildlife mitigation objectives in the Lower Columbia Subregion are consistent with the overall objectives outlined in the introduction to Section IV of this Workplan.

The wildlife mitigation strategies in the Lower Columbia Subregion are to:

- Ensure HEP estimates are consistent with original loss assessment methodology.
- For Oregon subbasins, continue to identify potential projects through the GAP analysis and coordinate implementation through the Oregon Wildlife Coalition.

Past Accomplishments

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
#9107800	Burlington Bottoms Wildlife Mitigation Project	ODFW	Willamette	Green Peter, Bonneville	1,319
#9205900	Amazon Basin/Eugene Wetlands Phase II	TNC	Willamette	Lookout Point	815
#9206800	Implementation of Willamette Basin Mitigation Program--Wildlife	ODFW	Willamette	All Willamette projects	To be determined

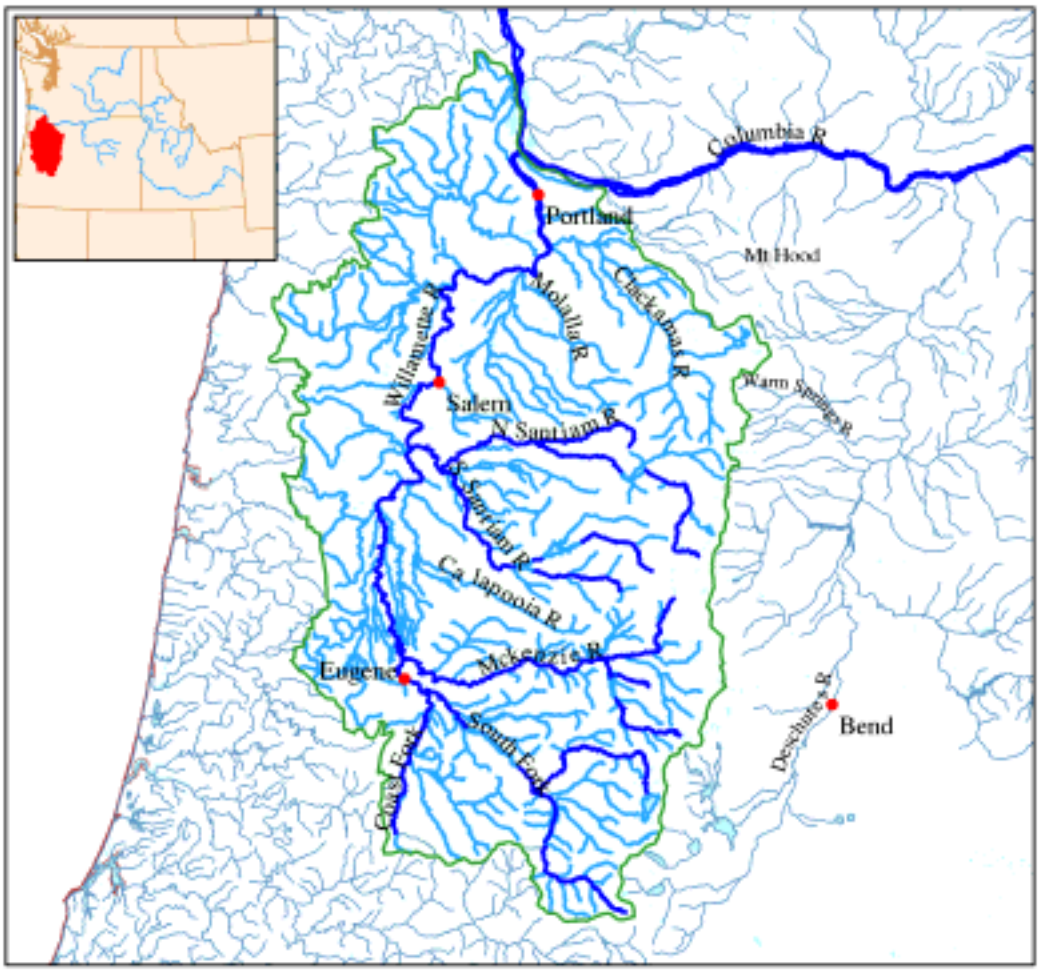
Expected Outcomes

It is expected that recommended projects (listed below) and future projects will fully mitigate the wildlife losses caused by the construction of the hydropower system.

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
#9061	River Wetlands Restoration and Evaluation Program	USFS	Sandy	Bonneville	To be determined
#9062	Sandy River Delta Riparian Reforestation	USFS	Sandy	Bonneville	To be determined
#9705906	OWC - McKenzie River Islands	ODFW	Willamette	Cougar	100-150
#9705907	OWC - E. E. Wilson WMA Additions	ODFW	Willamette	Lookout Point	200-350
#9705908	OWC - Multnomah Channel	Metro	Willamette	Detroit	400-500
#9705909	OWC - Mitchell Point	ODFW	Lower Columbia Mainstem	Bonneville	20
#9705916	Tualatin River National Wildlife Refuge Additions	ODFW	Willamette	Detroit Dam	300

Refer to project descriptions for more information on these projects.

1. Willamette Subbasin



The Willamette River Subbasin is located in western Oregon and covers about 11,250 square miles. The mainstem of the Willamette River is formed by the confluence of two forks near the southern end of the subbasin. The Willamette, which is the 12th largest river in the United States, flows 187 miles northward into the Columbia River. Historically, Willamette Falls has been the most serious physical obstacle to salmon migration in the Willamette Subbasin. Winter steelhead and spring chinook were the only anadromous fish that had access above the falls, but passage improvements and hatchery inputs have allowed other anadromous species to become established in the subbasin. U.S. Army Corps of Engineers projects such as Detroit, Foster, Cougar and Lookout Point on tributaries of the Willamette all contribute to temperature problems that affect fish and wildlife. The hydroelectric complex at Willamette Falls is the only generation on the mainstem Willamette.

The majority of land along the Willamette River is in private ownership. The state, Bureau of Land Management, and the U.S. Fish and Wildlife Service own less than 2 percent. Agriculture is the predominant land use along the river. Oregon's largest cities, including Portland and Eugene, are along the Willamette River.

The primary native anadromous fish species targeted for active management in the Willamette Subbasin include spring chinook, winter and summer steelhead, Pacific lamprey, and white sturgeon. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural economic practices while protecting the biological integrity and the genetic diversity of the watershed.

"Inspection Service for Little Fall Creek Passage" (project #8612400) provides for the O&M and repair of the Little Fall Creek fish passage facilities. "Willamette Hatchery Oxygen Supplementation" (project #8816000)will finish work studying whether the rearing capacity of chinook salmon in a surface water hatchery could be increased through use of supplemental oxygen without reduction in survival to adulthood. Analysis of data and the final report will be completed by September 2000. Project #9607000 (McKenzie River Focus Watershed Coordinator) will continue coordination of McKenzie Focus Watershed Council planning, education, assessment, research, monitoring, and fish and wildlife enhancement projects.

The primary native resident fish species targeted for active management in the Willamette Subbasin include white sturgeon, bull trout, rainbow trout, cutthroat trout, whitefish, and Oregon chub. Two goals capture the management intent for these populations: 1) protect and enhance production and distribution of these species throughout their historical range; and, 2) provide fisheries and harvest opportunities. Each of these goals have been further defined by a series of management objectives that describe population numbers and dynamic rate functions, areas of distribution, fishery characteristics, and harvest levels. These objectives are described in the Multi-Year Implementation Plan (CBFWA June 4, 1997) and in a series of fish management plans for subbasins throughout the Willamette Valley developed by the Oregon Department of Fish and Wildlife.

To achieve management objectives for the fish species of interest in the Willamette Subbasin, fish managers have defined several broad strategies. From a population perspective, the strategic intent is to maintain and enhance production, maintain genetic diversity and adaptiveness, and re-establish populations where appropriate. From a managers perspective, the strategic intent focuses on learning more about the condition of existing fish populations and the habitat, protecting and enhancing the habitat, creating harvest opportunities, and managing angling demand consistent with healthy fish populations.

Specific actions can be defined for each of these strategies. Fish production is to be maintained and enhanced by managing habitat and harvest and using artificial production. Genetic diversity and adaptiveness of fish populations are maintained by establishing and

protecting refuges for wild populations and managing risks associated with the use of artificial production. Populations are to be re-established within historic ranges by connecting habitats, and re-establishing natural production. Learning is to be accomplished by assessing fish population status, fish distribution, and habitat conditions, and monitoring responses of each to management actions. Habitat is to be protected and enhanced by providing necessary stream flows, improving water quality, providing upstream and downstream passage, and halting and reversing habitat degradation. Harvest opportunities are to be created by using artificial production and improving natural production. Angling demand is to be managed by promoting angling opportunities and controlling angler access.

Most of the management actions for resident fish in the Willamette Subbasin are funded by sources other than Bonneville Power Administration (BPA). In fact, only one BPA-funded project exists; "Bull Trout Assessment-Willamette/McKenzie", which began in 1994. Through 1997, the project focused on learning about population status, distribution, and habitat utilization of bull trout in the upper Willamette Subbasin. The project also is assessing the potential for expanding bull trout distribution by reintroducing naturally-produced bull trout to recently opened habitat in Sweetwater Creek.

The expected outcome of this project is a program that protects and enhances production of bull trout in the upper Willamette Subbasin and augments and/or reintroduces bull trout in the Middle Fork Willamette River.

D. Lower Mid-Columbia Subregion

The Lower Mid Columbia Subregion is defined as the Columbia River and its tributaries from Bonneville Dam to Priest Rapids Dam (excluding the Snake River and its tributaries). This subregion covers approximately 38,100 square miles and includes the following subbasins: Lower Mid Columbia Mainstem, Wind, Big White Salmon, Little White Salmon, Hood, Klickitat, Fifteenmile, Deschutes, John Day, Umatilla, Walla Walla, and Yakima.

The Lower Mid-Columbia Subregion consists of the Columbia River and its tributaries from Bonneville Dam upriver to Priest Rapids Dam. The major tributaries, for which anadromous fish subbasin plans exist, are the Wind, Big White Salmon, Klickitat, Hood, Fifteenmile Creek, Deschutes, John Day, Umatilla, Walla Walla, and Yakima. The Anadromous Fish Managers are refining objectives, strategies and actions for the Lower Mid-Columbia Subregion. This report does not summarize the Wind and Big White Salmon subbasins.

In the Lower mid Columbia Subregion, the following overall objectives guide resident fish mitigation: 1) to maintain and restore population productivity reduced by hydropower development and operations to healthy levels which provide opportunities for consumptive and non-consumptive uses of native populations or other species whose use is constrained by the sensitive populations; 2) to ensure population levels of native fish in Subbasin tributaries are above minimum viable population sizes which maintain adaptability and genetic diversity, and maximize probability of survival; 3) restore abundance and productivity of naturally –produced white sturgeon to the maximum extent allowable by existing habitat capacity; 4) restore long-term sustainable yield of white sturgeon sport and tribal fisheries; and, 5) identify and consider additional mitigation if needed. Specific actions to address these objectives three bull trout/native trout projects (9405400,9033 and 9095) and one white sturgeon project (8605000).

The specific wildlife mitigation goal for the Lower Mid-Columbia River Subregion is to fully mitigate for the wildlife losses caused by the construction and operation of the hydroelectric projects located in the subregion. These hydro projects are listed below, with the estimated losses due to hydropower construction and habitat mitigation priorities as listed in the NPPC's Fish and Wildlife Program.

Lower Mid-Columbia Subregion HU Losses by Hydro Project	
Hydro Project	**HU loss**
McNary	23,545
John Day	36,555
The Dalles	2,330
Total	**62,430**

Lower Mid-Columbia Subregion Wildlife Mitigation Priorities	
Habitat Type	**Priority**
Riparian/River	High
Shrub-Steppe	High
Wetlands	High
Islands	Medium
Agricultural Lands	Low

The wildlife mitigation objectives in the Lower Mid-Columbia Subregion are consistent with the overall objectives outlined in the introduction to Section IV of this workplan.

The wildlife mitigation strategies in the Lower Mid-Columbia Subregion are to:

- For Oregon subbasins, continue to identify potential projects through the GAP analysis and coordinate implementation through the Oregon Wildlife Coalition.
- Resolve crediting issues for proposed Oregon Wildlife Coalition projects before implementation.
- Work with NPPC, BPA, COE, and others to resolve issues involving the CTUIR Corps Lands proposal.

Past Accomplishments

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9009200	Wanaket Wildlife Mitigation Project	CTUIR	Lower Mid-Columbia Mainstem	McNary	3,934
9106100	WDFW Projects	WDFW	Yakima	see project 9609400	see project 9609400
9206200	Yakama Nation - Riparian/Wetlands Restoration	YIN	Yakima	McNary, John Day	4,144
9506001	Enhance Squaw Creek Watershed for Anadromous Fish & Wildlife Habitat	CTUIR	Umatilla	John Day	3,832

Expected Outcomes

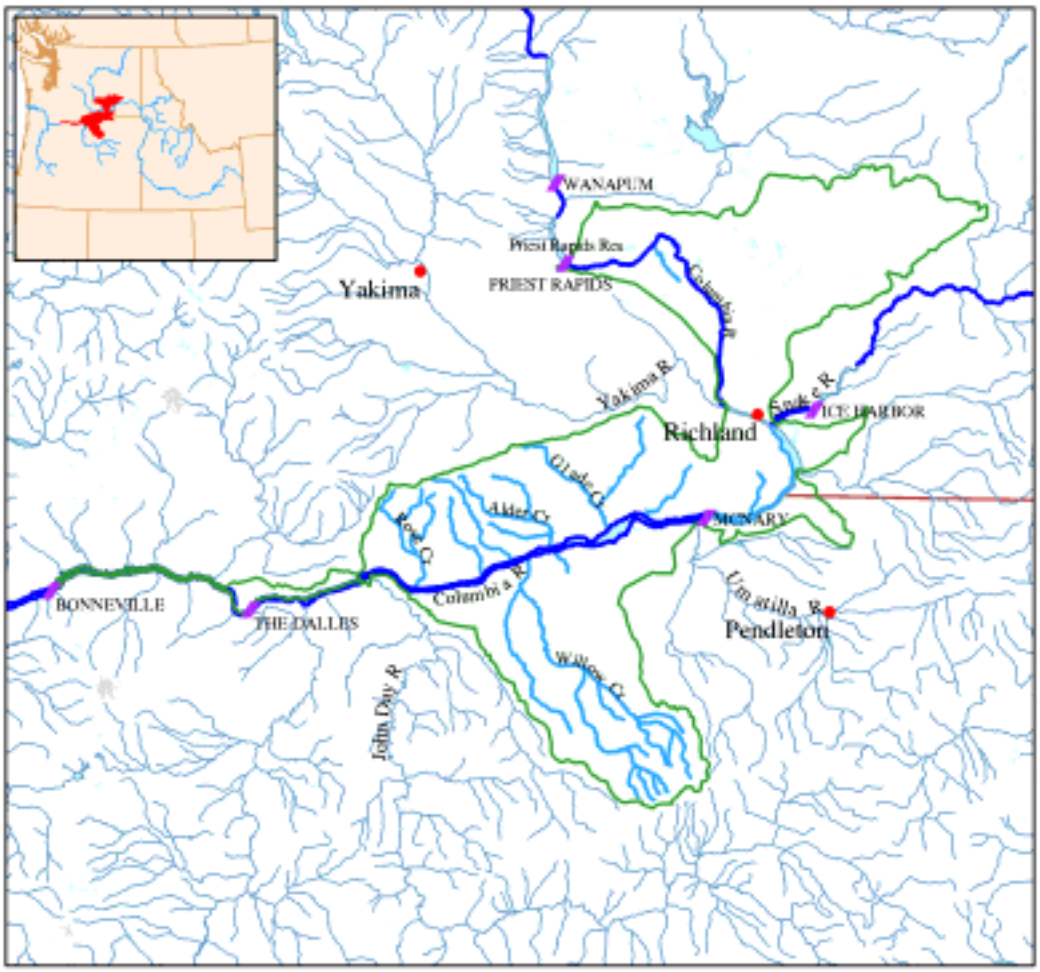
It is expected that recommended projects (listed below) and future projects will fully mitigate the wildlife losses caused by the construction of the hydropower system.

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9140	OWC - Acquisition of Pine Creek Ranch	CTWSRO	John Day	John Day	13,000
9206200	Yakama Nation - Riparian/Wetlands Restoration	YIN	Yakima	Ice Harbor, Lower Monumental, McNary, John Day, The	1,750

				Dalles, Bonneville	
9705904	OWC - Horn Butte	ODFW	Lower Mid-Columbia Mainstem	John Day	2,000-3,500
9705910	OWC - Trout Creek Canyon	ODFW	Deschutes	The Dalles	1,000-1,500
9705911	OWC - Irrigon WMA Additions	ODFW	Lower Mid-Columbia Mainstem	McNary	40
9705913	OWC - South Fork Crooked River	ODFW	Deschutes	The Dalles	800-1,000
9705915	OWC - Juniper Canyon and Columbia Gorge Wildlife Mitigation Project	CTUIR	Lower Mid-Columbia Mainstem	McNary	672

Refer to project descriptions for more information.

1. Lower Mid-Columbia Mainstem Subbasin



The Lower Mid-Columbia Mainstem Subbasin includes 251 miles of the mainstem Columbia River from Bonneville Dam to Priest Rapids Dam. The Columbia River flows east from Priest Rapids Dam, turns south in the vicinity of the Hanford Reach, flows southeast past its confluence with the Snake River, then turns west near the Oregon and Washington border and flows to the Bonneville Dam. From the base of Priest Rapids Dam downstream to the head of Lake Wallula above McNary Dam, the river flows unimpeded for approximately 50 miles through what is commonly referred to as the "Hanford Reach." The Hanford Reach is the only free-flowing portion of the Columbia River above Bonneville Dam in the United States.

Much of the shoreline along the Columbia River is privately owned. The Hanford Nuclear Reservation is a significant federal landholding, which extends along the southwest shoreline of the Columbia River from several miles downstream from Priest

Rapids Dam to north Richland. Except for intake and discharge structures for the nuclear reactors at the Hanford Reservation, this reach of the Columbia remains undeveloped. Across the river, private lands are used for various irrigated crops, but the shoreline fringe remains generally undeveloped. The U.S. Fish and Wildlife Service and the Washington Department of Fish and Wildlife own extensive landholdings opposite the Hanford Nuclear Reservation, which remain in a largely natural state.

The primary native resident fish species targeted for active management in the Lower Columbia mainstem reach of the Lower Mid-Columbia Subbasin include white sturgeon, bull trout, rainbow trout, and cutthroat trout. Two goals capture the management intent for these populations: 1) to protect and enhance production and distribution of these species throughout their historical range; and, 2) to provide fisheries and harvest opportunities. Each of these goals have been further defined by a series of management objectives that describe population numbers and dynamic rate functions, areas of distribution, fishery characteristics, and harvest levels. These objectives are described in the Multi-Year Implementation Plan (CBFWA June 4, 1997) and in a series of species management plans developed by the Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, and Columbia Basin tribes.

To achieve management objectives for the fish species of interest in the Lower Mid-Columbia Mainstem, fish managers have defined several broad strategies. From a population perspective, the strategic intent is to maintain and enhance production, maintain genetic diversity and adaptiveness, and re-establish populations where appropriate. From a managers perspective, the strategic intent focuses on learning more about the condition of existing fish populations and the habitat, protecting and enhancing the habitat, creating harvest opportunities, and managing angling demand consistent with healthy fish populations.

In the mainstem, specific actions can be defined for each of these strategies. Fish production is maintained and enhanced by managing operations of the Federal Columbia River Power System (FCRPS) to protect and enhance habitat and by managing harvest. Genetic diversity and adaptiveness of fish populations are maintained by facilitating migration and genetic exchange among subpopulations that have been separated and isolated within impoundments by hydroelectric projects and managing risks associated with the use of artificial production. Likewise, specific actions in the tributaries can be defined for each of these strategies. Fish production is maintained and enhanced by managing habitat and harvest and using artificial production. Genetic diversity and adaptiveness of fish populations is maintained by establishing and protecting refuges for wild populations and managing risks associated with the use of artificial production. Populations are re-established within historic ranges by connecting habitats, and re-establishing natural production. Learning is accomplished by assessing fish population status, fish distribution, and habitat conditions, and monitoring responses of each to management actions. Habitat is protected and enhanced by providing necessary river flows, improving water quality, providing passage by hydroelectric projects, and halting and reversing habitat degradation. Harvest opportunities are created by using artificial

production and improving natural production. Angling demand is managed by promoting angling opportunities and controlling angler access.

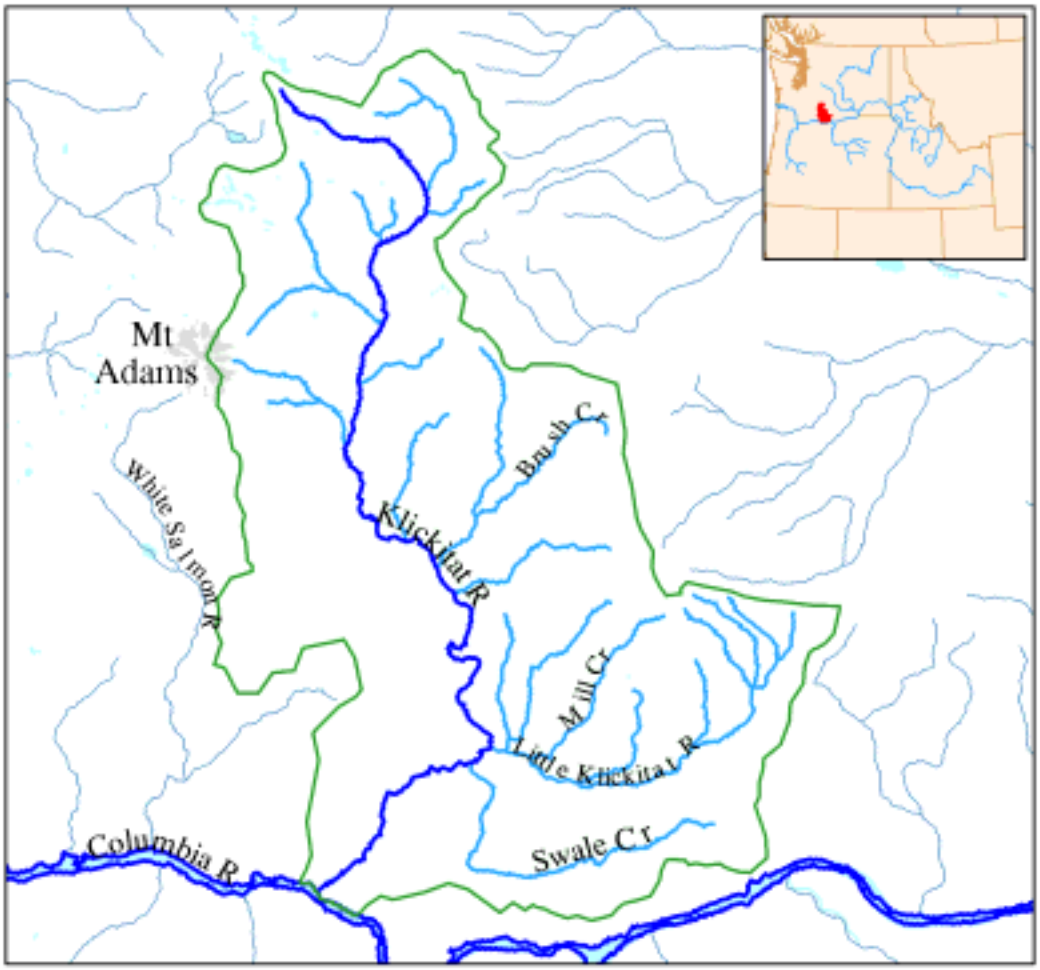
Most of the management actions for resident fish in the Lower Mid Columbia Mainstem and tributaries are funded by sources other than Bonneville Power Administration (BPA). In fact, only four BPA-funded projects exist. All of these projects span multiple subbasins, but are described here for simplicity. "White Sturgeon Productivity, Status and Habitat Requirements", began in 1986. Through 1997, the project has characterized population status, distribution, and habitat utilization of white sturgeon in mainstem reservoirs in the Lower Mid-Columbia Subregion. Based on these characterizations, the project has estimated reductions in production of white sturgeon caused by construction and operation of the FCRPS and has begun implementing measures to mitigate those effects. Measures include more intensive population monitoring and harvest regulation, implementation of a pilot project to test whether production can be enhanced by transplanting white sturgeon from more productive to less productive reservoirs, and identifying FCRPS operations that would increase spawning and rearing success downstream from projects.

"Bull Trout Genetics, Habitat Needs, Life History, etc., in Central and Northeast Oregon" began in 1994. Through 1997, the project has characterized population status and distribution of bull trout in many Oregon tributaries of the Columbia River. In these same areas, the project has characterized the genetic diversity and integrity of bull trout populations. It has also characterized habitats where bull trout have been found, including describing the relationship between stream temperature and distribution. Finally, the project has studied life history characteristics such as spawning and migration behavior and is characterizing how bull trout interact with introduced brook trout.

"Bull Trout Population Assessment in the Columbia River Gorge, WA" is new and begins work in 1999. Its intent is similar to the project in Oregon. It will characterize status and distribution and characterize the genetic diversity and integrity of bull trout in Washington tributaries of the Columbia River.
"Document Native Trout Populations" began in 1998 to document the existence and present distribution of indigenous populations of bull trout, redband trout, and westslope cutthroat trout and assess the extent of hybridization between indigenous and non-indigenous salmonids in Columbia River tributaries in Washington.

The expected outcomes of these projects are a mitigation program that: 1) optimizes natural production and harvest of white sturgeon populations in mainstem Columbia River reservoirs; 2) protects and restores native trout populations; and, 3) provides harvest opportunities, where appropriate. The bases of these programs are population status, distribution, genetics, habitat needs, life history characteristics, and interactions with other species.

2. Klickitat Subbasin



The Klickitat River Subbasin on the east slope of the Cascade Mountains in south-central Washington covers approximately 1,350 square miles. The Klickitat River originates in Yakima County and runs generally southward for 95.7 miles to the Columbia River. The topography ranges from rolling hills and plateaus in the south to rugged mountains in the northwest.

About 75 percent of the subbasin is forested. Forestry and agriculture dominate the economy. The Yakama Indian Nation, private individuals, and the state of Washington are the major landowners.

The primary native anadromous fish species targeted for active management in the Klickitat Subbasin are spring and fall chinook, summer steelhead, and coho. The goal for these species is to restore sustainable, naturally producing populations to support tribal

and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

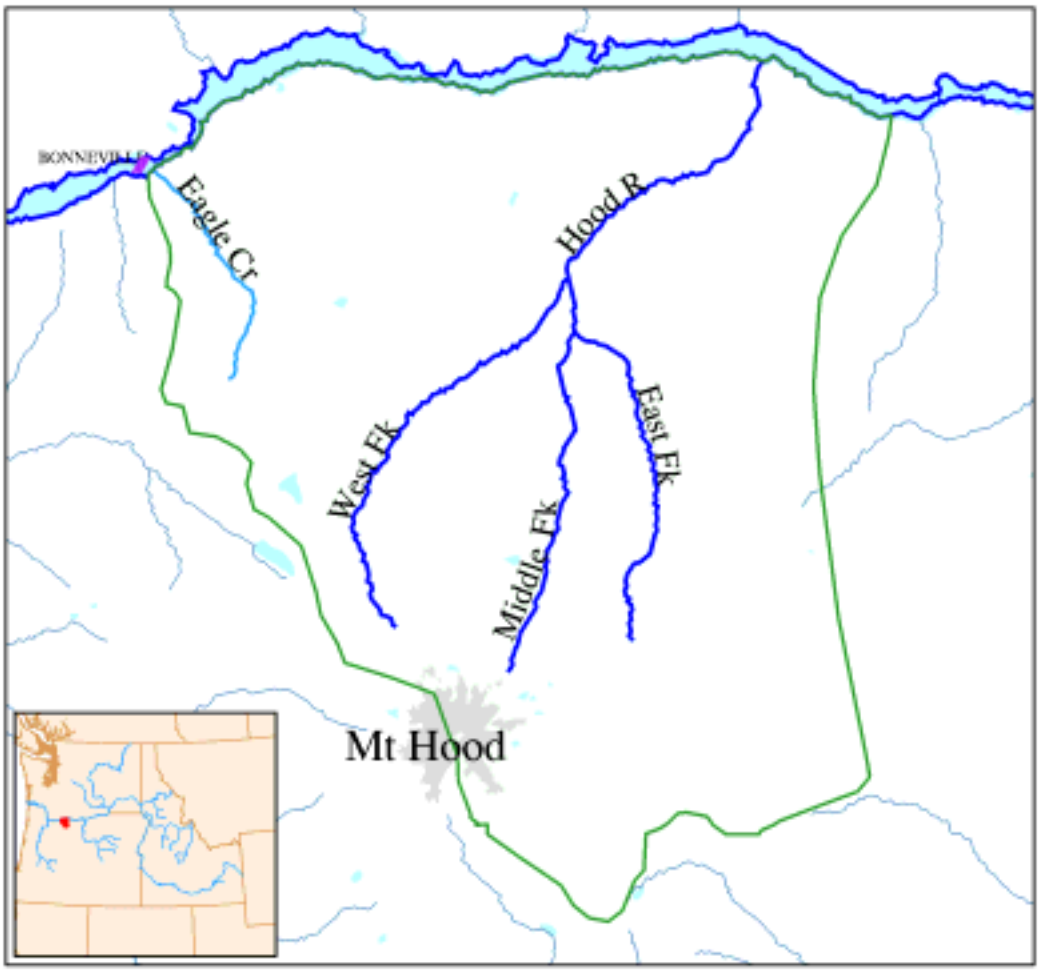
Several ecosystem problems are present in the Klickitat Subbasin. For example: spring chinook access to habitat in the upper Klickitat River is impacted by a barrier dam at Klickitat Hatchery and passage is impeded at Castile Falls (RM 64). Poor design and maintenance of forest road crossings in the Little Klickitat River inhibits passage of steelhead and resident salmonids in tributaries and inhibits winter rearing and egg-fry survival for various species of salmonids (especially in the Little Klickitat and left-bank tributaries of the Klickitat). Summer flows are low in low elevation tributaries which have over appropriated water rights. Nutrients from farming and a sewage treatment outfall on the Little Klickitat River cause excessive algal growth, and other small tributaries share similar problems. Sediment from glacial runoff from Mt. Adams, combined with insufficient large woody debris and stream channel complexity reduces holding areas and rearing success.

The following outcome-based objectives have been defined for the Klickitat Subbasin: 1) improve adult pre-spawning survival; 2) improve juvenile (egg to smolt) survival; 3) improve adult and juvenile passage; and, 4) release additional genetically-appropriate salmon in the subbasin. Several broad strategies have been defined to achieve these objectives. These include placing a higher emphasis on passage, water quality and quantity, and other long-term tangible habitat improvement measures. The Yakima/Klickitat Fisheries Plan serves as a management structure for planning supplementation projects to restore and enhance stock and stock status, focusing on areas made accessible by habitat improvements.

Specific actions needed to carry out the management strategy include habitat improvement through inventory of culverts and diversions, passage improvements (e.g., Little Klickitat and Castile Falls), habitat restoration projects, and monitoring and evaluation. Project #9506800 provides funding for an integrated watershed analysis to produce information needed to identify necessary passage and habitat improvements including design and construction of identified projects. Project #9705600 is a riparian and in-channel habitat enhancement project. The anadromous fish co-managers (WDFW and YIN) continue discussions to develop and implement a water conservation plan for the Klickitat Subbasin including strategies to purchase water rights. Using artificial production to supplement natural production and to increase harvest opportunities is being implemented under the YKFP.

The ongoing work continues to provide critical information for the planning and implementation of strategic actions to achieve the objectives. Project #8903000 (ended in FY 1998) evaluated the effect of acclimation on spring chinook smolt survival – supporting the use of acclimation for supplementation actions.

3. Hood River Subbasin



The Hood River Subbasin in north-central Oregon covers approximately 352 square miles. The Hood River flows northeasterly into the Columbia River. The river's mainstem and its Middle and East forks experience high turbidity and heavy siltation from glacial runoff from Mount Hood.

Federal, state, tribal and county agencies own or manage lands in the subbasin. The U.S. Forest Service and Hood River County own or manage a significant amount of acreage. Private lands are used for agriculture, as well as timber production. The predominant type of agriculture is irrigated farming. The city of Hood River is the only municipality in the subbasin.

The indigenous anadromous fish species targeted for management in the Hood River Subbasin are spring and fall chinook, winter and summer steelhead, coho, and lamprey.

The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource conditions in the Hood River that present problems to these species include the use of non-native/out of subbasin hatchery fish programs in the Hood subbasin; basin wide over-harvest of wild stocks; natural habitat degradation such as turbidity from melting glaciers on Mount Hood, and man-caused habitat problems such as unscreened or inadequately screened diversions, water quality degradation, artificial barriers, diverted stream flows in the mainstem and tributaries, and other land management practices.

The entire subbasin is located within the ceded lands of the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO). Much of the subbasin is owned by the U.S. Forest Service, Hood River County Forestry Department, and Longview Fibre Company. PacifiCorp Powerdale Dam is a FERC licensed facility and the project is currently undergoing relicense review. The co-managers and fisheries resources co-managed by the Tribes and the Oregon Department of Fish and Wildlife have adopted the following outcome-based objectives: 1) re-establish naturally sustaining spring chinook using Deschutes stock; 2) rebuild naturally sustaining runs of summer and winter steelhead; 3) maintain the genetic characteristics of the population; 4) contribute to tribal and non-tribal fisheries, ocean fisheries, and the Northwest Power Planning Council's interim goal of doubling salmon runs; 5) provide optimum habitat for all freshwater life history stages of anadromous salmonids; and, 6) maintain or improve passage for upstream and downstream migrant salmonids.

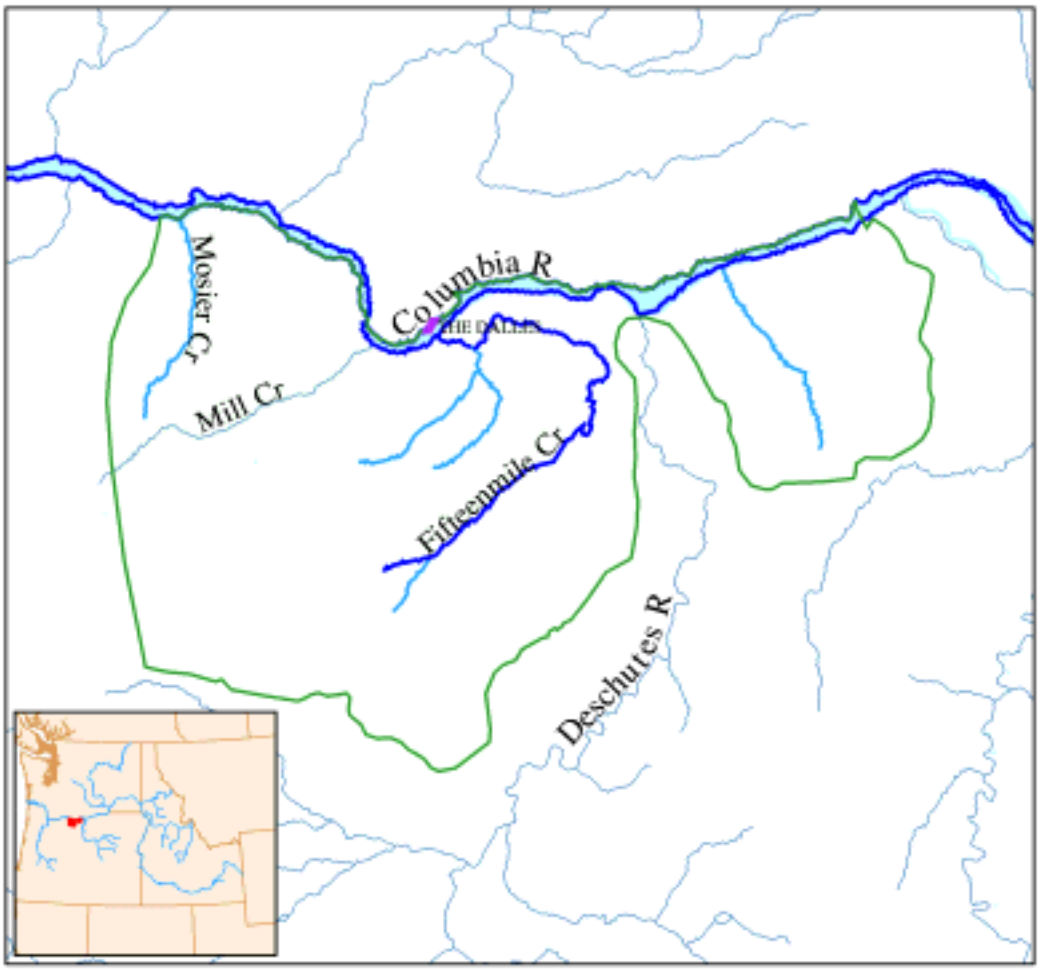
The managers have defined several strategies that are aimed at meeting the objectives, including supplementing spawning populations with local broodstock to enhance natural production (Objective 1, 2, 3, & 4) accompanied by intensive monitoring and evaluation for adaptive management purposes; and improving habitat through the use of instream structures, water quality and quantity optimization, riparian management, passage improvements at barriers and the screening of irrigation diversions (Objectives 5 and 6).

Specific actions intended to carry out the management strategies include the following: Project #9301900 is to re-establish spring chinook and winter and summer steelhead. Project #8902900 was initially a construction project for Pelton ladder rearing facility which was converted to a production project for spring chinook in 1995. Project # 9500700 funds PGE for O&M at Pelton Ladder rearing facility for spring chinook and winter steelhead. Project #8805303 funds CTWSRO for monitoring and evaluation and project #8805304 funds ODFW for monitoring and evaluation. Project 9301900 funded design and construction of adult trapping at Powerdale Dam and currently funds design and construction of Parkdale holding and spawning facilities and expansion of hatching and rearing facilities at Oak Springs Hatchery. Project #9126 consists of several habitat improvement components, including construction of a fish ladder on Tony Creek, eliminating a man-made barrier and restoring three miles of winter steelhead, coho, and resident trout spawning and rearing habitat; constructing two water diversion fish screens,

eliminating direct fish mortality; and fencing one-half mile of riparian, allowing recovery from livestock.

The managers completed an instream structure and improved adult passage at Moving Falls on the West Fork. A major diversion on the East Fork (East Fork Canal) was screened under a cost-share project.

4. Fifteenmile Subbasin



The Fifteenmile Creek Subbasin in north-central Oregon covers approximately 373 square miles. Fifteenmile Creek flows northeast out of the Mount Hood National Forest and then circles north through dry land wheat country southeast of The Dalles before dropping down to the Columbia River. The U.S. Forest Service is the primary land manager, administering approximately 19 percent of the subbasin. Timber production is the major land use. Private lands are used for a variety of agricultural purposes, with dry land farming the dominant type of agriculture.

The anadromous fish species most actively targeted for management in the Fifteenmile Creek Subbasin is the native winter steelhead. There is only incidental natural production of spring chinook, and the management intent for Pacific lamprey is under discussion. The goal for these species is to restore sustainable, naturally producing populations to

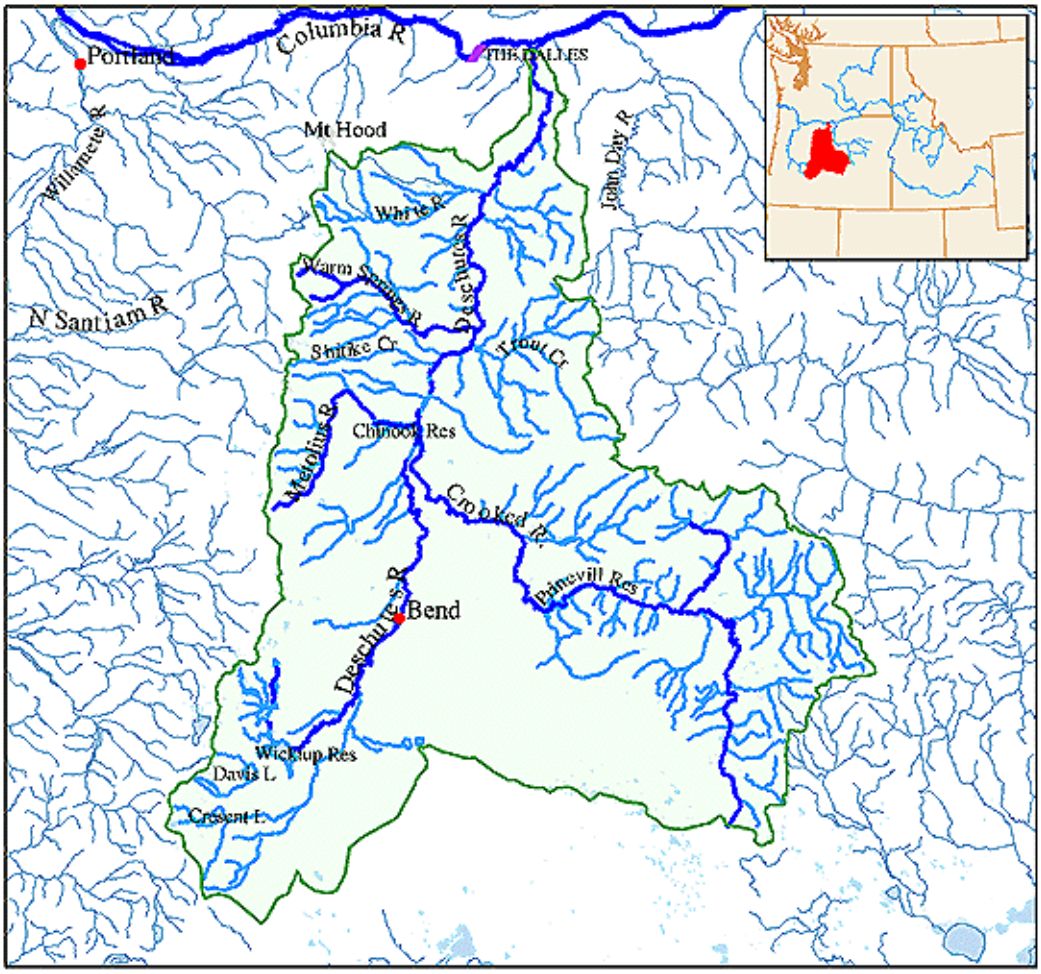
support tribal and non-tribal harvest and cultural economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Fish production in the subbasin is that production is limited by water quality, low flows caused by irrigation withdrawals, and degradation of riparian zones caused by channelization, overgrazing and logging. Dry land farming and grazing on open rangeland have eliminated and degraded the riparian zone throughout much of the middle and lower drainage. Logging practices on forest lands in the upper drainage have decreased the ability of the upper watershed to store water and regulate runoff resulting in frequent high runoff events and channel shifts. Irrigation withdrawals deplete many streams by late spring or early summer, and juvenile salmonids are lost where irrigation diversions are either unscreened or inadequately screened.

The co-managers have adopted the following outcome-based objectives to address these problems. Improve: 1) adult pre-spawning survival; 2) juvenile survival; 3) instream and riparian habitat conditions; and, 4) adult and juvenile passage. The strategic approach to achieving these objectives includes improving habitat through riparian fencing, fish screens at irrigation diversions, instream structures and passage improvements. Currently, the specific actions funded under the NPPC Fish and Wildlife Program are in project #9304000, which implements new habitat improvements and provides operations and maintenance of past investments. The CBFWA recommends that two new projects be funded in Fifteenmile Creek in FY 1999. Project 9146 will provide monitoring and evaluation of the population status of winter steelhead; and project #9087 will purchase an 1860 irrigation water right and transfer it to instream use, and will provide monitoring and protection of the instream right to prevent removal by junior appropriators, and outreach to other senior water right holders to identify additional acquisition opportunities.

Fencing excludes livestock from 40 miles of Fifteenmile Creek. Five unfenced miles of stream are protected by lease agreements with landowners to exclude livestock grazing. To date ODFW has installed 900 instream fish habitat structures and maintains six fish screens with BPA funding. ODFW has also used Mitchell Act funding to install and maintain 100 rotary pump fish protection screens and six gravity diversion fish protection screens. All high priority diversions have been screened.

5. Deschutes Subbasin



The Deschutes River Subbasin in north-central Oregon is the second largest watershed in the state, covering approximately 10,500 square miles. The Deschutes River flows north through central Oregon and enters the Columbia River 205 miles from the Pacific Ocean.

About 62 percent of the land is privately owned; federal ownership (U.S. Forest Service and Bureau of Land Management) accounts for 15 percent; and 21 percent are Tribal lands (Confederated Tribes of the Warm Springs Reservation). Forestry, timber production, grazing and agriculture (dry land farming) are major land uses. Portland General Electric's Pelton-Round Butte project and the Warm Springs Tribes' Pelton Reregulating Dam are the only hydroelectric facilities. Northern Wasco County People's Utility District has applied for a permit to develop a hydropower project at White River Falls.

The anadromous fish species most actively targeted for management in the Deschutes Subbasin are native spring chinook and summer steelhead. Summer/fall chinook are managed for wild production, and a small remnant run of sockeye persists. Pacific lamprey are also a species of concern in the Deschutes River. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Anadromous fish populations are depressed due primarily to the impacts of mainstem Columbia and Deschutes dam construction, out-of-subbasin harvest, instream and riparian habitat degradation, water quality and quantity reductions and potential genetic impacts to wild stocks from release of out-of-subbasin hatchery fish. Riparian areas on tributaries are degraded from overgrazing, and low juvenile survival in east side tributaries is caused by low stream flows and high water temperatures from water withdrawals for irrigation and degradation of riparian habitat from overgrazing. Round Butte and Pelton dams, constructed in 1958 and 1964 (respectively) have eliminated spawning and rearing habitat for spring chinook, sockeye, and summer steelhead. Juvenile fish are also lost at unscreened irrigation diversions.

The co-managers have adopted the following outcome-based objectives to address these problems: 1) improve the quantity and quality of aquatic and riparian habitat; 2) maintain and improve upland watershed conditions to sustain high water quality; 3) maintain the genetic diversity, adaptiveness, and abundance of the indigenous wild fish; 4) provide opportunities to harvest anadromous species, while maintaining adequate wild spawning escapement and hatchery broodstock; and, 5) increase harvest opportunity for hatchery-origin summer steelhead and spring chinook through the use of acclimation and adult capture facilities.

The co-managers have defined the following strategies to help achieve the objectives. These strategies include improving habitat through the use of riparian fencing, grazing management and instream structures; improving screens on irrigation diversions; and increasing harvest opportunities for tribal and non-tribal fisheries using artificial production while maintaining the genetic integrity of the wild fish by not allowing hatchery fish above the hatcheries.

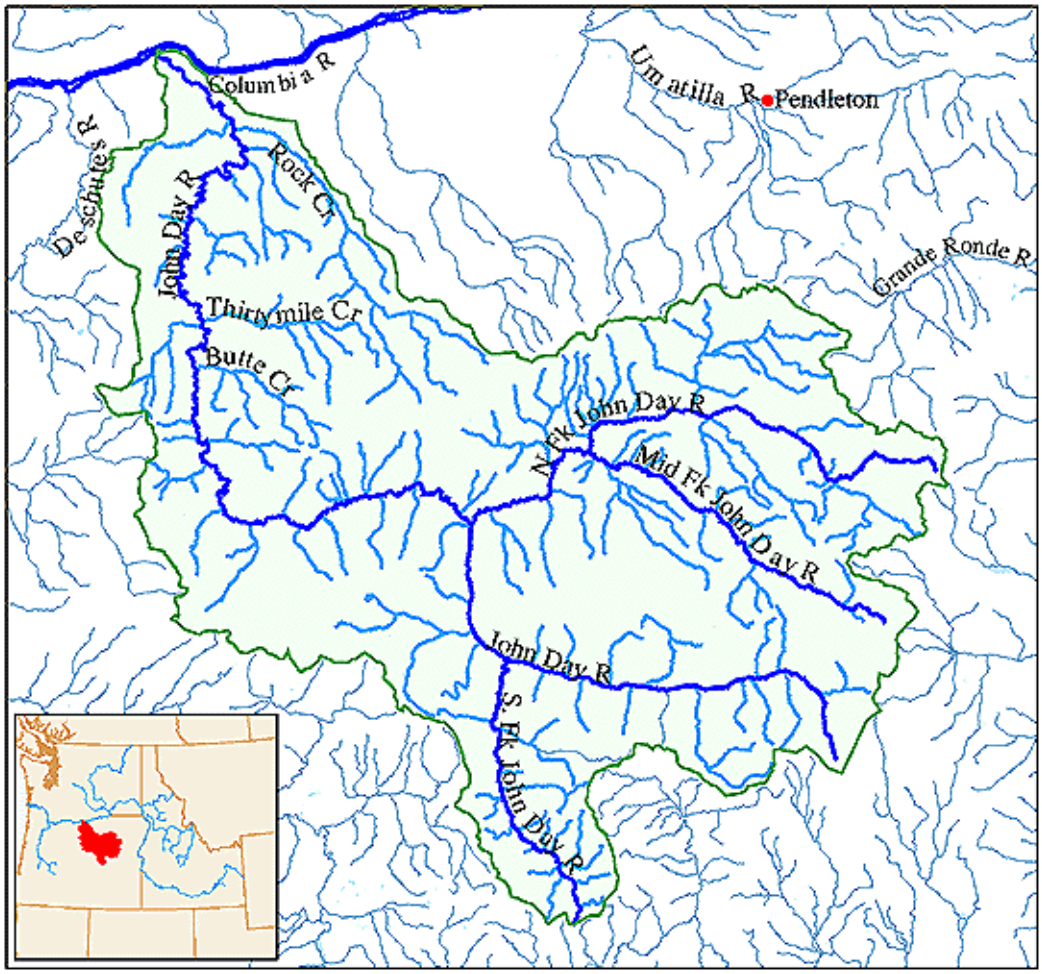
Project #9404200 funds the operations and maintenance for the Trout Creek Habitat Improvement Project which started in 1982 and targeted steelhead. The Trout Creek watershed is fully screened (41 diversions), and maintenance of the screens is funded under #9306600 (cost shared with Mitchell Act funds. Watershed enhancement activities on the reservation will be funded under project #9138 in conjunction with activities funded by CTWSRO, BIA, NRCS and other entities. Project #9005 will provide start-up funds for riparian restoration and enhancement projects and for working with private landowners and resource managers to improve livestock management and reduce the impacts on riparian vegetation. Push-up dams will be consolidated by constructing cement diversions and/or infiltration sump/pump systems. Project #9007 (Middle Deschutes Watershed Coordinator) will coordinate with the Willow Creek & Trout Creek

Watershed Councils to complete watershed assessments and develop goals, objectives, priority lists, action plans and a work plan to actively seek funding for on-the-ground projects in both watersheds. Project #9133 will initiate riparian work as the second phase of a comprehensive watershed treatment approach, and will construct 1.5 miles of riparian exclosure fencing as a demonstration project.

Projects funded by PGE (under FERC license conditions) and USFWS (under BPA MOA-Reimbursables) cover the cost of hatchery production for the Deschutes River Subbasin. ODFW and CTWSRO have instituted "catch and release" harvest regulations on naturally produced salmon and steelhead. Acclimation and release locations allow directed harvest of hatchery produced fish. Hatchery fish are not allowed above the Warm Springs National Fish Hatchery in order to protect wild spring chinook and steelhead; and no hatchery production of summer/fall chinook occurs to protect those wild stocks.

Over the past several years, fencing has excluded livestock from the lower 25 miles of the mainstem Deschutes. Grazing management protects the upper 40 miles.

6. John Day Subbasin



The John Day River Subbasin in east-central Oregon includes 11 counties and covers nearly 8,100 square miles. The John Day River is the longest free-flowing river solely containing wild salmon and steelhead in the Columbia Basin. The upper part of the subbasin is one of Oregon's most physiographically diverse regions with mountains, rugged hills, and plateaus cut by streams and valleys. The lower part of the subbasin is a plateau of nearly level to rolling land deeply dissected by the river and its tributaries. The mainstem John Day River flows 284 miles from its source in the Strawberry Mountains to the Columbia.

Land cover in the subbasin is predominantly forest and rangelands, with a small amount of cropland. More than 60 percent of the subbasin is privately owned. The U.S. Forest Service owns approximately 30 percent, and the Bureau of Land Management 7 percent. Recreation and tourism are increasing and becoming a complement to the agriculture and forest products sectors of the economy.

The indigenous anadromous fish species most actively targeted for management in the John Day Subbasin are spring chinook and summer steelhead. Wild fall chinook are also thought to be present, but no escapement estimates are available. Pacific lamprey are also a species of concern in the John Day River. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Inter-related water quantity and quality problems (e.g., low flows, high temperatures, sedimentation and pollutants) result in poor survival during juvenile rearing and migration. Low flows and diversion barriers restrict adult and juvenile migration, and riparian degradation and lack of pools reduces adult holding and juvenile rearing survival. These problems have caused major habitat fragmentation leading to poor connectivity, and reduced the historic range of spawning and rearing habitat. Combined with out-of-subbasin problems (e.g., Columbia mainstem passage and harvest), these problems have lead to reduced populations of spring and fall chinook and summer steelhead, which has greatly reduced production and lead to the loss of harvest opportunities.

The co-managers have adopted the following outcome-based objectives in order to address the problems that anadromous fish face while in the John Day Subbasin: 1) improve juvenile salmonid survival; 2) reduce pre-spawning mortality on adult salmonids; and, 3) protect wild anadromous fish stocks without hatchery supplementation. Several broad strategies have been identified to achieve these objectives. These include improving instream and riparian habitat, improving stream flows and adult and juvenile passage at diversions, monitoring habitat improvements to determine if physical and biological objectives are being met, not outplanting hatchery-origin salmon and steelhead, and discontinuing all catchable trout programs in areas where they may affect anadromous salmonids.

The John Day River Implementation Plan involves several agencies, private landowners, and tribes in an ambitious fish habitat protection and improvement program on private lands that began in 1984, including extending juvenile rearing habitat further downstream through riparian fencing. Specific actions which implement the management strategies include project #8402100 which provides long term protection, maintenance and restoration of fish habitat on private lands in the John Day subbasin through landowner agreements, fencing, instream structures, riparian plantings, critical stream bank stabilization and passage structures. Since 1993, about 76 miles of seasonal electric livestock exclosure fence has been constructed under project #9303800 to protect and restore approximately 60 miles of riparian habitat. Monitoring results indicate that the fences are 98 percent effective in excluding livestock. The Oregon Fish Screening Project (#9306600) cost shares with Mitchell Act funding to fabricate and maintain juvenile fish screens. Project 9605300 is the continuation of a multi-year project to restore the floodplain of the North Fork John Day River and its tributaries that were severly impacted by dragline dredge gold mining in the late 1930's through the early

1950's. This project re-deposits the tailings allowing the river to flow over portions of the floodplain previously unavailable. Channel complexity and fish habitat quality and quantity increase as the river reclaims its floodplain, dissipating the energy of high flow events and depositing sediment that promotes riparian vegetation growth.

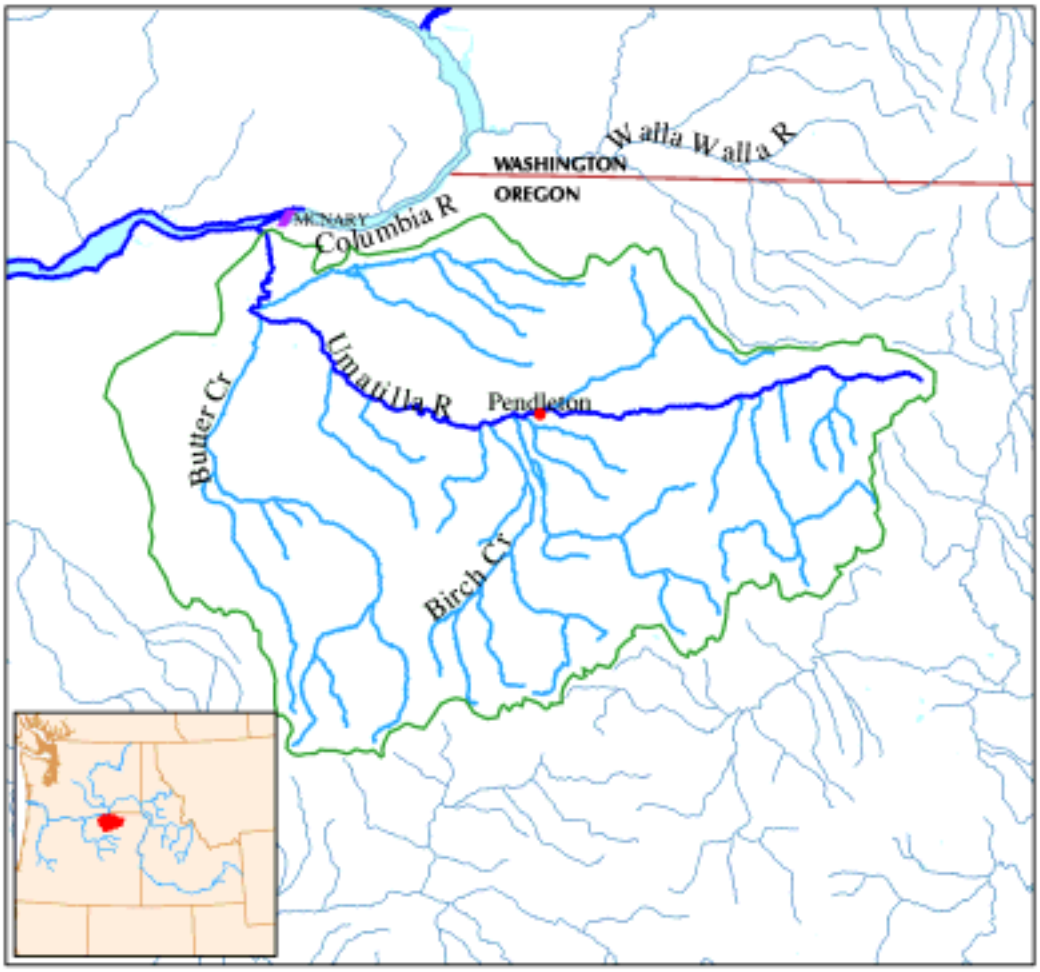
Project #9137 (cost-shared with the USBOR) increases in-season river flows through a combination of irrigation efficiency measures, reduces bank instability, sedimentation, and bedload movement thereby improving water quality, reducing or eliminating migratory delays from passage impediments, improving riparian condition and will implement an annual monitoring program. Project 9045 will eliminate gravel push-up dams on the lower North Fork John Day over the next four years in order to remove impediments to anadromous fish migration, improve water quality and habitat for both anadromous and resident fish, reduce sediment load from construction and washouts, and shrink surface area of water during annual periods of highest temperatures and solar radiation. Project 9012 is intended to slow runoff during the peak flow events, allowing the slow, safe release of water during the summer and further allowing buildup of sediment and riparian vegetation in order to improve spawning and rearing habitat by increasing flow during critical months, reducing damage to riparian vegetation, reducing summer water temperatures, and allowing recovery of channel morphology.

To meet the data needs for an index stock for PATH and other analyses, project #9144 will provide sufficient annual estimates of spring chinook spawner escapement, age-structure, and smolt-to-adult survival. Project #9703400 will measure surface fine sediment and overwinter sedimentation in salmon spawning habitat during the incubation period in portions of the Grande Ronde and John Day Rivers.

The acquisition of Pine Creek Ranch (Project #9139), by the CTWSRO will allow protection and restoration of a more normative ecosystem condition in the Pine Creek watershed. Objectives for managing the Pine Creek acquisition include: removing livestock from damaged riparian and upland areas, fencing, controlling noxious weeds, and burning to remove juniper.

The BPA has provided most of the funding for the implementation of the John Day River Implementation Plan, including projects #82002900, 8338400, 8339400&500, 8347300, 8400800, 8402100&200, 8507100, 9303800, and 9605300.

7. Umatilla Subbasin



The Umatilla River Subbasin is located in Umatilla County in northeast Oregon and covers 2,290 square miles. The Umatilla River originates on the west slope of the Blue Mountains in the Umatilla National Forest and flows northwesterly about 115 miles to the Columbia. The subbasin consists of the high relief Blue Mountains region, with elevations from 3,000 to 6,000 feet, and the Deschutes-Umatilla Plateau, a broad upland plain that slopes northward from the Blue Mountains to the Columbia River.

Approximately 51 percent of the Umatilla subbasin is privately owned; 37 percent is managed by federal agencies, principally the U.S. Forest Service; 1 percent is owned by the state of Oregon; and about 11 percent lies within the boundaries of the Umatilla Indian Reservation. Forest lands in the subbasin are managed for timber harvest, grazing and recreation. Much of the mid-subbasin is used for dry land wheat farming. Irrigation is the largest use of surface and groundwater in the subbasin, and many of the streams are over-appropriated. Seven irrigation diversion dams on the mainstem Umatilla River

obstruct upstream and downstream migration of anadromous fish. Passage improvements are planned or completed at all of these.

The indigenous anadromous fish species most actively targeted for management in the Umatilla River Subbasin are spring and fall chinook (extirpated and reintroduced), summer steelhead, coho (extirpated and reintroduced), and Pacific lamprey. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Water quantity and quality problems (e.g., low flows and high temperatures) result in poor survival during juvenile rearing and migration in the lower Umatilla River. Low flows and diversion barriers restrict adult migration and riparian degradation and lack of pools reduces adult holding and juvenile rearing survival in the upper reaches of the Umatilla subbasin. Water quantity, quality, and sediment problems reduce the success of fall chinook spawning. These problems have caused major habitat fragmentation and poor connectivity, and lead to the extirpation of spring and fall chinook, and coho, and have reduced populations of summer steelhead. This has greatly reduced productivity and has lead to loss of harvest opportunities.

The co-managers have adopted the following outcome-based objectives in order to address the problems that anadromous fish face while in the Umatilla Subbasin: 1) improve lower Umatilla survival during rearing and juvenile migration; 2) improve adult migration success; 3) improve adult holding and juvenile rearing survival in the upper Umatilla; 4) improve fall chinook spawning success; and, 5) release additional genetically-appropriate salmon in the subbasin.

Several broad strategies have been identified to achieve these objectives, including improving flows in the mainstem and improving upstream/downstream passage at mainstem diversions; reducing high water temperatures, sedimentation, and increasing the pool-to-riffle ratio through watershed protection and riparian and instream enhancements; providing hatchery production (with acclimation/release near natural spawning areas) using Umatilla broodstock (with satellite adult capture/holding) and natural production; and assessing progress and adapting strategies through monitoring and evaluation (addressing subbasin information needs).

Specific actions to implement these strategies include improving flows in the Umatilla mainstem (addressing Objectives 1,2 & 4) by exchanging the West Extension Irrigation District (WEID) withdrawal at Three Mile Dam with Columbia River water with operating costs funded by BPA (#8902700). This project also funds operating costs for exchanging mainstem Umatilla water that was withdrawn at Stanfield to refill Cold Springs Reservoir, with water pumped from the Columbia River allowing formerly diverted flows to remain in the Umatilla (Columbia River Pumping Plan - Phase II). The query for Congressional appropriations to develop water exchange with Westland Irrigation District (Columbia River Pumping Plan - Phase III) continues. Improvements to upstream/downstream fish passage at Umatilla mainstem diversions have largely been

implemented and are now in O&M mode. On-going screens & ladder O/M is implemented under project #8343600, and on-going trap-and-haul operations to move adults and juveniles around thermal and low flow blocks that remain is implemented under #802200.

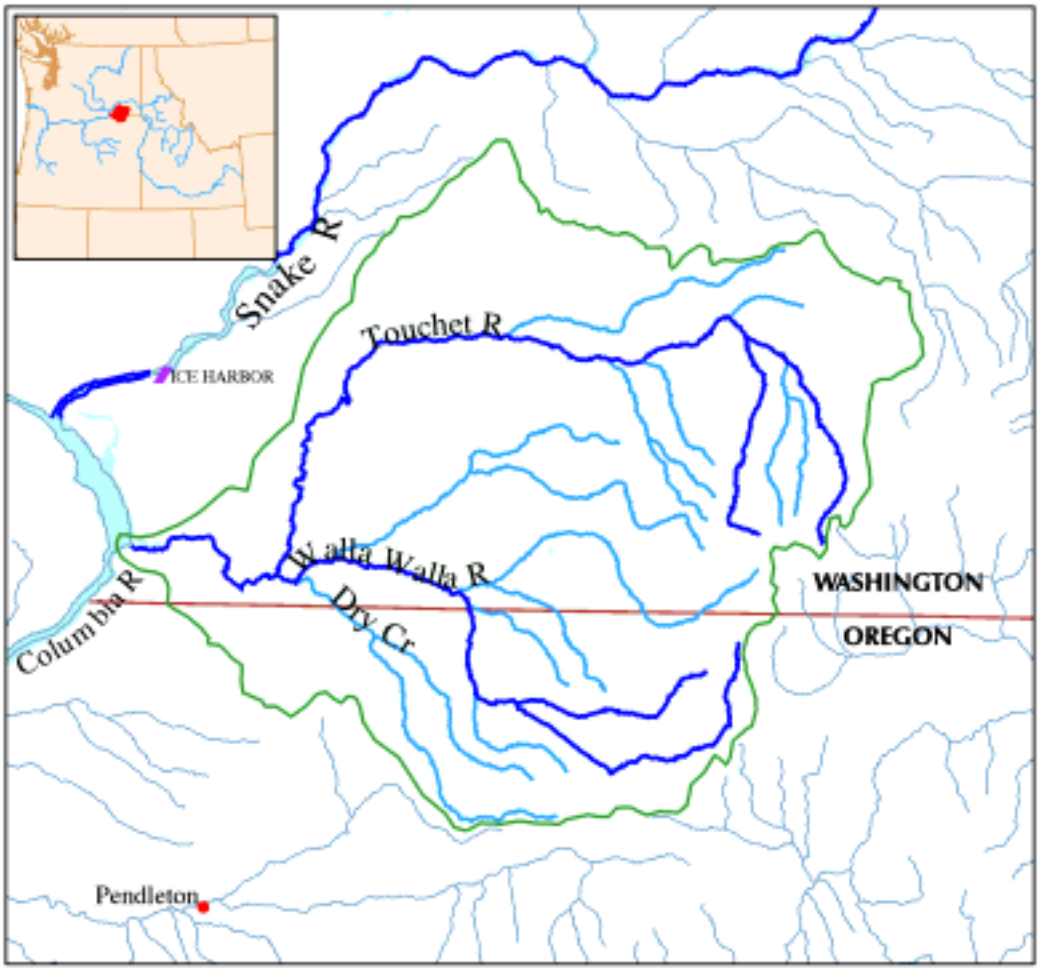
Projects #8710001 and #8710002 implement stream and riparian habitat improvements (fencing, instream structures for pools, bank stabilization and riparian plantings on private and federal land). Project #9092 will augment the CTUIR enforcement program in order to enforce land and water use practices, and other harvest restrictions in order to protect these investments.

Production actions addressing Objective 5 include operating and maintaining the acclimation/release facilities at Bonifer and Minthorn Springs and adult holding at Minthorn (#8343500 – listed under Walla Walla). O/M for the Umatilla Hatchery is funded under #8903500. Additional incubation/rearing capacity for Umatilla-bound chinook was recently completed at the South Fork Walla Walla facility, designed and constructed with funds under #8805302.

Several actions are being implemented in order to assess progress and adapt strategies through monitoring and evaluation (addressing subbasin information needs). Operation of screens and juvenile and adult passage is monitored under #8902401; hatchery operations and releases under #9000500; and, natural production under #9000501.

BPA funded #8902701 to determine the feasibility of releasing 6000 acre-feet of unallocated storage in McKay Reservoir for fish passage and temperature control in the Umatilla mainstem – this action is not being pursued at this time. The BPA funded the COE to blast a channel below Three Mile Dam to concentrate the little remaining instream flows. BPA funded new state-of-the-art screens and ladders at Stanfield, Maxwell, Three Mile, Westland, Feed/Cold Springs, and other diversions. Habitat improvement work has included projects # 9604500, 9606800, and 8710000 (which funded the removal of low flow blockage of Meachum Creek due to alluvial deposits). The Squaw Creek riparian habitat is protected through land purchase, jointly funded from Anadromous Fish and Wildlife budgets (#9506000). BPA funding was used to design and build a chinook and steelhead hatchery adjacent to the Irrigon Hatchery (#8433000); and build Imeques and Thorn Hollow acclimation/release facilities and an additional facility design (#9101400).

8. Walla Walla Subbasin



The Walla Walla River Subbasin covers approximately 1,758 square miles in northeastern Oregon and southeastern Washington; about 73 percent of the drainage lies within Washington. The Walla Walla River originates in the Blue Mountains in northeast Oregon and flows west and north into Washington to the Columbia River. Elevations in the subbasin range from about 270 feet at the Columbia River, to about 3,000 feet in the Blue Mountains, to 6,000 feet at mountain crests.

Most of the land is privately owned, including about 96 percent of the subbasin lands in Washington. The higher elevation areas are managed for multiple uses, including timber harvest, livestock grazing, and motorized recreation. Mid-elevation lands are devoted to dry land farming and grazing. The Walla Walla River Valley is extensively and intensively irrigated. Irrigation is the largest use of surface and groundwater in the subbasin.

The indigenous anadromous fish species most actively targeted for management in the Walla Walla River Subbasin are spring chinook, coho, and summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Although problems associated with gravel mining, diking, forest, and grazing practices exist, the most significant habitat impacts in the Walla Walla system are associated with the extensive network of irrigation diversions. Numerous passage problems for both adults and juveniles exist throughout the basin. The mainstem of the Walla Walla is de-watered in places and has very low flows and high stream temperatures in others during the summer. These problems have caused major habitat fragmentation and resulting poor connectivity. Combined with out-of-subbasin problems (e.g., Columbia mainstem passage and harvest), these problems have lead to the extirpation of spring chinook and coho, and greatly reduced populations of summer steelhead and bull trout. This has greatly reduced production and lead to loss of harvest opportunities.

The co-managers have adopted the following outcome-based objectives in order to address the problems that anadromous fish face while in the Umatilla Subbasin: 1) improve adult holding and rearing survival; 2) improve adult and juvenile migration success; 3) release additional genetically-appropriate steelhead in the subbasin; and 4) restore a naturally reproducing population of spring chinook.

The strategies for achieving these objectives are to: 1) implement instream and riparian habitat enhancement and watershed protection projects with an emphasis on high-impacted private lands in order to overcome the key limiting factors of high water temperatures and sedimentation; 2) implement fish passage improvement projects such as instream flow augmentation, screening at irrigation canals, ladders at diversion dams, and fish trap and haul operations which are intended to minimize mortality of migrating juvenile and adult fish; and, 3) develop and implement a comprehensive watershed-based restoration program using hatchery production to re-introduce the extirpated spring chinook population and to supplement the existing run of steelhead including monitoring and evaluation of the Walla Walla Subbasin salmon restoration strategy that will be conducted to assess the success of habitat improvement actions and various artificial propagation strategies and the reproductive success of re-introduced spring chinook.

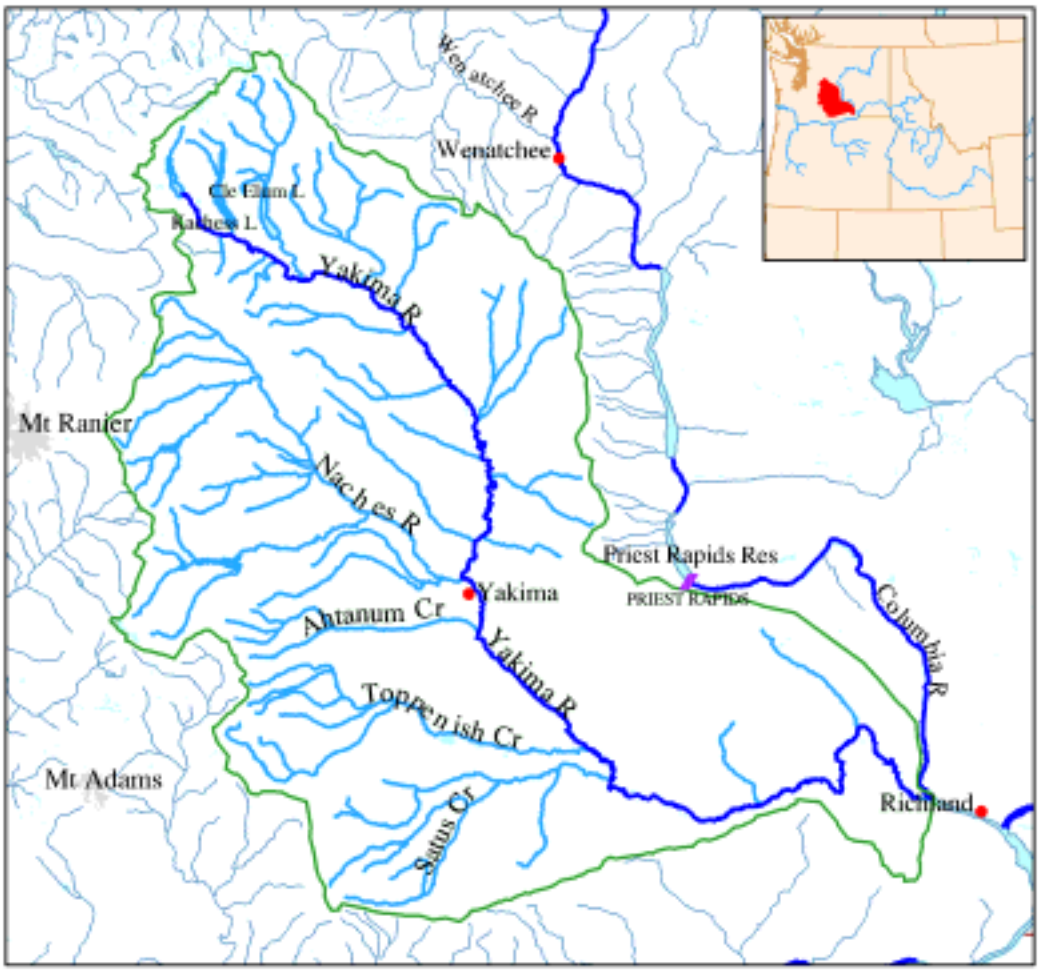
Specific actions which carry out these strategies include: 1) habitat enhancement planning; 2) watershed coordination; and, 3) some initial habitat improvements implemented under project #9604601 and will be joined by WDFW efforts under project #9010. Some passage improvement planning and improvements at two diversions have been done under projects #9601100 & #9601200.

Genetically appropriate broodstocks will be used to carry out hatchery production objectives, which will involve off-site central production facilities and in-basin juvenile acclimation/release facilities located near natural production sites. Satellite adult

trapping, holding, and spawning facilities will be needed for broodstock development as adult returns increase. Current outplanting of summer steelhead is funded under the Lower Snake River Compensation Program (LSRCP).

Some habitat coordination, planning, and improvements have been funded by projects #9604600 and #9606400.

9. Yakima Subbasin



The Yakima River Subbasin in south central Washington covers about 6,155 square miles around the city of Yakima. The Yakima River originates near the crest of the Cascade Range above Keechelus Lake and flows 214 miles southeast to the Columbia River. Topography of the subbasin is characterized by a series of long ridges that extend eastward from the Cascades and encircle flat valley areas. Six major reservoirs are located in the subbasin (Keechelus, Kachess, Cle Elum, Rimrock, Bumping, and Clear Lake). Six major diversion dams are on the mainstem Yakima (Easton, Roza, Wapato, Sunnyside, Prosser, and Horn Rapids) and two are on the Naches (Wapatox and Naches Cowiche).

The Yakama Indian Reservation is located in the southwest corner of the subbasin just south of the city of Yakima. Patterns of land ownership within the subbasin are complex: approximately 32 percent is private; 30 percent is tribal; 28 percent federal; and 10

percent state. The predominant types of land use are irrigated agriculture, urbanization, timber harvesting and grazing. Although the area affected by timber harvesting and grazing is roughly five times the area affected by agriculture and urbanization, the intensity of activity makes agriculture and urbanization of primary importance to water quality.

The indigenous anadromous fish species most actively targeted for management in the Yakima River Subbasin are spring and fall chinook, coho, and summer steelhead. Summer chinook and sockeye are extirpated, and little is currently known about Pacific lamprey status. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Intensive agriculture (irrigation diversions and return flows and grazing) has caused widespread habitat degradation. Resource problems include low flows at diversions, water quality degradation and pesticides, illegal harvest and harassment that reduces adult migration and pre-spawning survival. Low flows, high temperatures and sedimentation reduce fall chinook spawning success. Sediment, predators and lack of side-channel refuges limit juvenile rearing and over-wintering survival. Sediment also limits egg-to-fry emergence survival for all species of salmonids in virtually all reaches of the Yakima Basin. Low flows and inadequate diversion screening reduces juvenile migration survival. Low flows and other barriers have reduced the habitat formerly accessible to salmon. Other problems leading to ecosystem degradation which limit production include: mining waste disposal; grazing; residential development; conversion of land-use; inadequate flood studies, stormwater and riparian management; inadequate enforcement of existing laws regulating shoreline management and development.

These problems have caused major habitat fragmentation and resulting poor connectivity. Combined with out-of-subbasin problems (e.g., Columbia mainstem passage), these problems have lead to the extirpation of summer chinook, sockeye and coho, and reduced populations of spring and fall chinook and summer steelhead. This has caused under-seeded habitat, greatly reduced production and loss of harvest opportunities.

In order to address problems the anadromous fish face in the Yakima subbasin, the co-managers have adopted the following outcome-based objectives**:** 1) restore Yakima Basin ecosystem integrity/function throughout all life history phases by implementing a "normative" or historical river ecosystem as an overall goal; 2) identify the limiting factors such as thermal block, predation, water quality/quantity (e.g., lower Yakima River) and improve juvenile/adult migration success and adult pre-spawning survival; 3) improve juvenile rearing and over-wintering survival and adult spawning habitat in tributaries; 4) re-open blocked habitat, including blocking structures and dewatering; 5) improve fall chinook spawning success; and, 6) release additional genetically-appropriate salmon in the subbasin.

Several strategies have been identified to achieve these objectives including: reducing adult passage and pre-spawning mortalities by improving flows at the dams within the

Yakima; increasing enforcement and public awareness; increasing juvenile rearing survivals through sediment control and predator reduction measures; enhancing over-wintering survival through the development of side-channel "refuges" for smolts; decreasing tributary and Yakima mainstem passage mortality for out-migrating smolts through a combination of irrigation screening and flow improvements; conducting a major experimental supplementation program designed to address genetic risks by using locally compatible broodstock; increasing access to potentially productive habitat (in the Teanaway River tributary would be accomplished by addressing in-stream flow restrictions on the lower section of that drainage) within the drainage; and incorporating monitoring and evaluation elements aimed at addressing key questions of application.

Specific actions (projects) which implement these strategies include: continuing efforts to negotiate agreements with BOR and PPL to subordinate power generation to instream fish needs. Coordination, planning, and using new information to adaptively implement projects is covered by projects #9506404, #8812001, and #9067. Project #9405900 provides educational outreach in an effective way to gain regional support for Objective 1.

Several projects are most critical to identify limiting factors and implementing improvements to migration success and pre-spawning survival, including projects #8812008, 9101, 9102, 9603501, and 9704900. Since about FY 1989, BPA and BOR completed a multi-million dollar program to improve the major irrigation diversions on the Yakima/Naches mainstem by building new screens and ladders. Phase II involves improvements to 60 smaller diversions mostly on tributaries and is about 3/4 completed. Current efforts include completion of Phase II construction (9105700 & 9107500); O/M for completed improvements (9200900); and on-going evaluation of improved screens/ladders (#8506200). Improvements to adult spawning habitat in tributaries and juvenile rearing and over-wintering survival are funded under project #9705100; and re-opening blocked habitat is recommended for funding under project #9100.

Major supplementation activities are under way in the Yakima subbasin, funded under project #9603301. Two central incubation/rearing facilities are nearing completion and twelve satellite facilities are under construction or planned for adult collection/holding and juvenile acclimation/release. Planning, design and construction funding is nearing completion (#8811500). Projects #9503300 and 9701300 provide O&M for production facilities.

Several projects implement additional supplementation actions, including research projects that examine the interaction of salmonid species (#9506402); development and refinement of natural production objectives and strategies (#9706200); and improvements in supplementation fish (#9105500, #9506406). Project #9603302 evaluates the potential risks of coho reintroductions. Overall monitoring and evaluation occurs under projects #9506300 and #8812005.

Habitat enhancement planning and implementation have been funded under BPA projects #9603500, 9608200, 9704700 and 9705300. Research and planning was undertaken

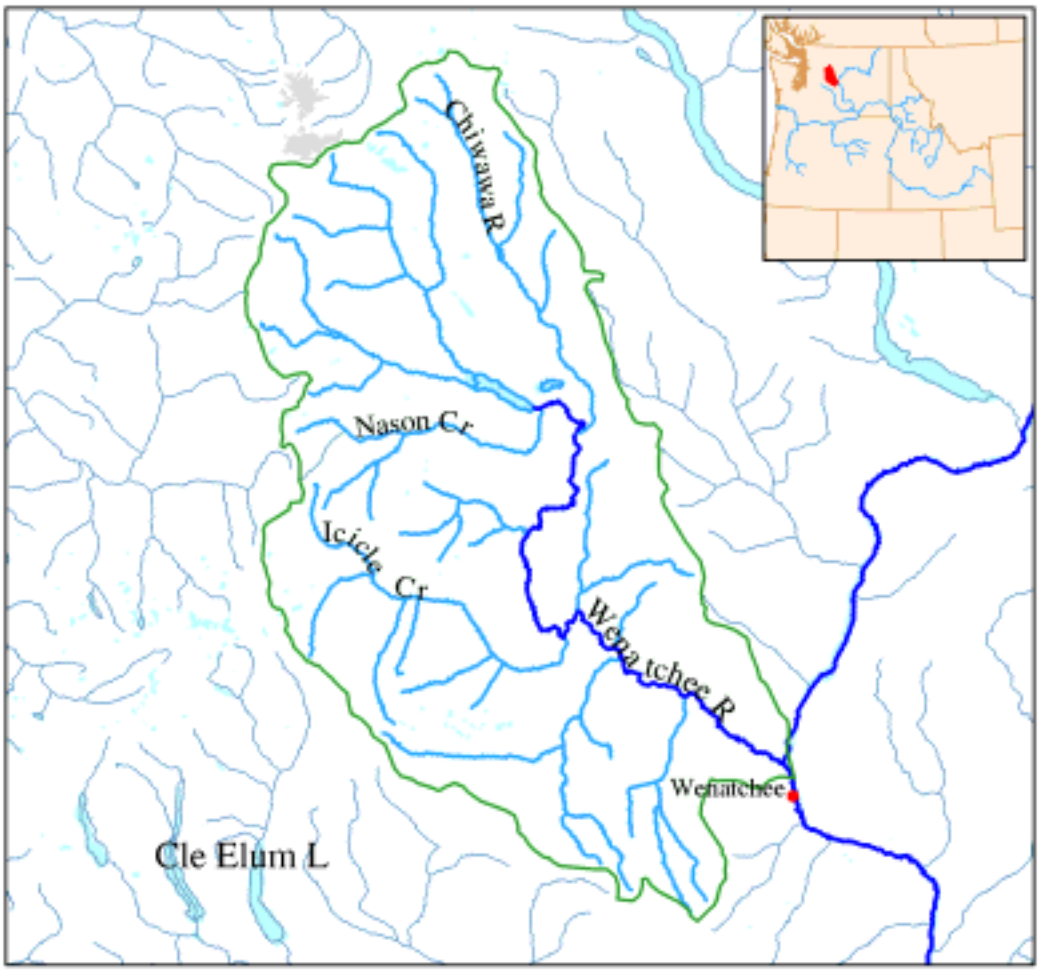
starting in FY 1982 for the supplementation program to increase local stocks. Much has been completed, including detailed planning/feasibility studies (#8713500, 8812000, 8908200, 9005800, 9506405) spawning population (#8201600, 8812007) and genetic inventories (#9506403). Development of a disease-free sockeye broodstock was funded under #8604500; and spring chinook life history studies (#9202200, 8201600, 8812000, 8908900).

E. Upper Mid-Columbia Subregion

The Upper Mid Columbia Subregion is defined as the Columbia River and its tributaries from Priest Rapids Dam to Chief Joseph Dam. This subregion covers approximately 13,900 square miles and includes the following subbasins: Upper Mid Columbia Mainstem, Wenatchee, Entiat, Lake Chelan, Okanogan / Similkameen, Methow, and Crab.

The Anadromous Fish Managers are refining objectives, strategies and actions for the Upper Mid-Columbia Subregion. Individual subbasin summaries follow. This report does not summarize the Entiat subbasin. The goal is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

1. Wenatchee Subbasin



The Wenatchee River Subbasin in north central Washington covers approximately 1,327 square miles. The Wenatchee River flows in a southeasterly direction to the Columbia River. The watershed originates in the high mountainous regions of the Cascade Crest, with numerous tributaries draining sub-alpine regions within the Alpine Lakes and Glacier Peak wilderness areas.

Land ownership is in a checkerboard pattern in many areas of the subbasin, alternating between private and federal ownership. Approximately 77 percent is in federal ownership, with the U.S. Forest Service by far the largest owner. More than one-quarter of the land is within wilderness boundaries. Approximately 22 percent is privately owned, with about 1 percent in state ownership. Large corporate landowners manage much of the private lands for timber production.

The indigenous anadromous fish species most actively targeted for management in the Wenatchee River Subbasin are spring and summer chinook, sockeye, and summer steelhead. Coho are extinct, and little is currently known about Pacific lamprey status. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource problems include: diversion of water for irrigation and stream channelization which have significantly reduced fish production while inadequately screened irrigation diversions result in downstream migrant losses; entrainment of adult and juvenile migrating fish at the mainstem Dryden Diversion; and irrigation withdrawals significantly reduce habitat quality on the mainstem and render several tributaries, notably Peshastin Creek, nearly unusable for anadromous fish. River bank armoring on the lower river has greatly reduced rearing area for summer chinook. Icicle Creek is so over-appropriated that summer water temperatures exceed lethal levels. Highway construction and attendant channel realignment, bank hardening, and loss of riparian vegetation have severely limited rearing habitat downstream of Lake Wenatchee.

To address these problems, the co-managers have adopted the following outcome-based objectives: 1) improve adult pre-spawning survival; 2) improve juvenile rearing survival; 3) improve juvenile migrant survival; and, 4) utilize supplementation to improve natural production and re-establish naturally spawning populations.

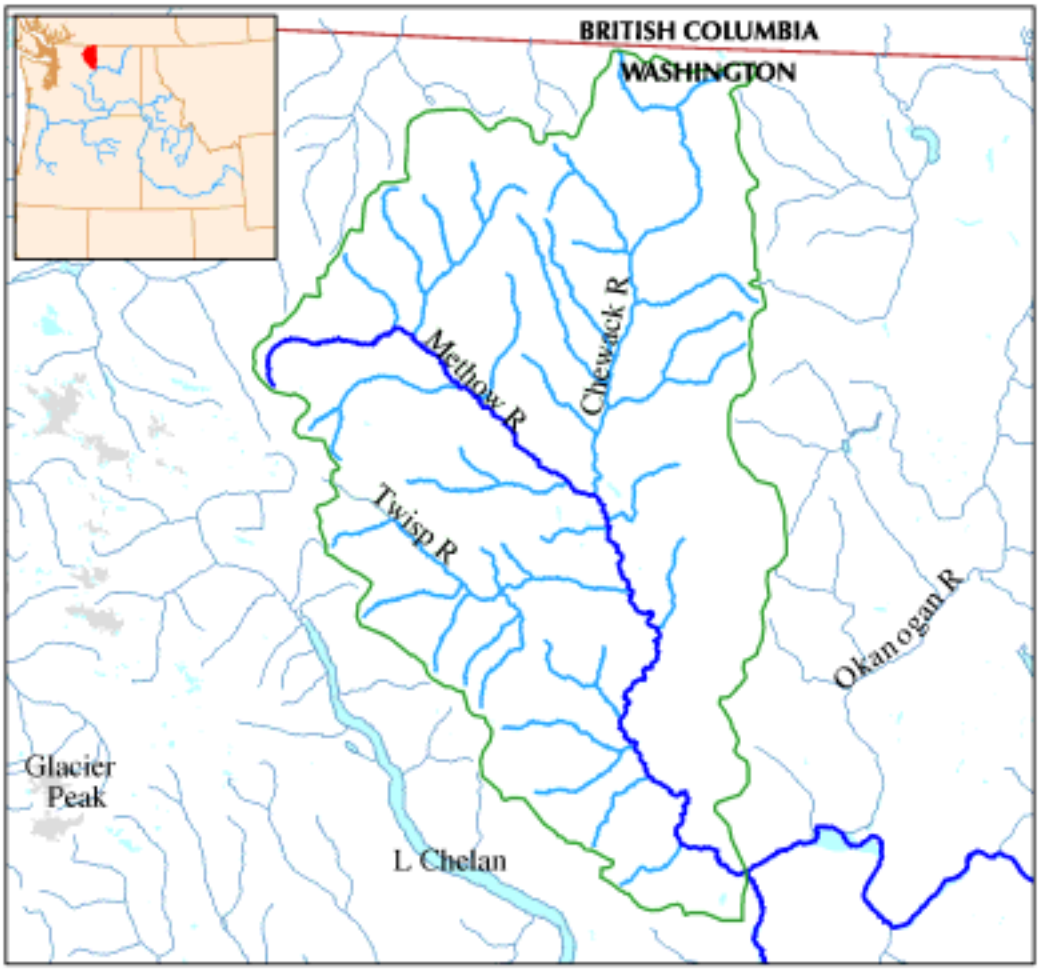
Strategies which achieve the objectives include improving habitat through implementation of habitat restoration and fish passage projects; and supplementing naturally spawning populations to enhance natural production and re-establish natural production.

Mainstem passage improvements for the three mid-Columbia Projects downstream of the Wenatchee River are being implemented through the mid-Columbia Coordinating Committee. Lower Mainstem passage survival improvements are being pursued through the Snake River Recovery planning efforts. Tributary passage is being addressed through irrigation screening activities. Additional habitat protection activities are being developed and pursued through the mid-Columbia Habitat Conservation Plan currently under development.

Re-establishing coho to the Wenatchee and Methow through supplementation is implemented under project #9604000. This project implements the design and construction of rearing and acclimation facilities, O & M, and monitoring and evaluation. Supplementation is being implemented (with mid-Columbia PUD funding) through the Rock Island Dam Settlement Agreement. Supplementation activities are based upon multiple collection and release sites throughout the drainage in order to protect the genetic integrity of the run. A spring chinook hatchery program centered on Icicle Creek has been carried out through Leavenworth National Fish Hatchery (BOR Reimbursable Budget - MOA).

Project #9044 will provide funding to replace the Chumstick Creek culvert that has severely impeded fish passage for many years.

2. Methow Subbasin



The Methow River Subbasin in north central Washington covers approximately 1,800 square miles. The Methow River originates on the eastern slopes of the Cascade Mountains and flows southeast to the Columbia River. The subbasin contains a wide variety of landscape and geological formations. The western part has deep U-shaped valleys carved between steep, highly dissected Alp-like ridges and peaks.

Forestry is the principal land use, and the U.S. Forest Service owns 94 percent of the land. The remaining acreage is mostly private, with small parcels of state forest land. Livestock grazing is the second largest land use, and irrigated agriculture the third. Irrigated agriculture is the primary consumer of water. Most hydroelectric projects use small tributary streams in remote locations.

The indigenous anadromous fish species most actively targeted for management in the Methow River Subbasin are spring and summer chinook, and summer steelhead. A

minor population of coho may still spawn in the system. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The most significant impact to habitat quality has been irrigated agriculture. Flows in the mainstem downstream of Winthrop and the lower sections of all major tributaries are significantly reduced by irrigation withdrawals. During late summer most of the minor tributaries are completely diverted for irrigation. Many irrigation diversions are unscreened or inadequately screened. Highway construction and other development (agricultural, residential and municipal) along the few sites below the confluence of the Methow and Chewach rivers which historically supported riparian vegetation, have conspired to limit habitat productivity in this reach.

To attempt to meet the subbasin goal, and address the resource problems, the co-managers have adopted the following outcome-based objectives: 1) improve adult pre-spawning survival; 2) improve juvenile survival; and, 3) utilize supplementation to increase natural production and to re-establish naturally producing runs.

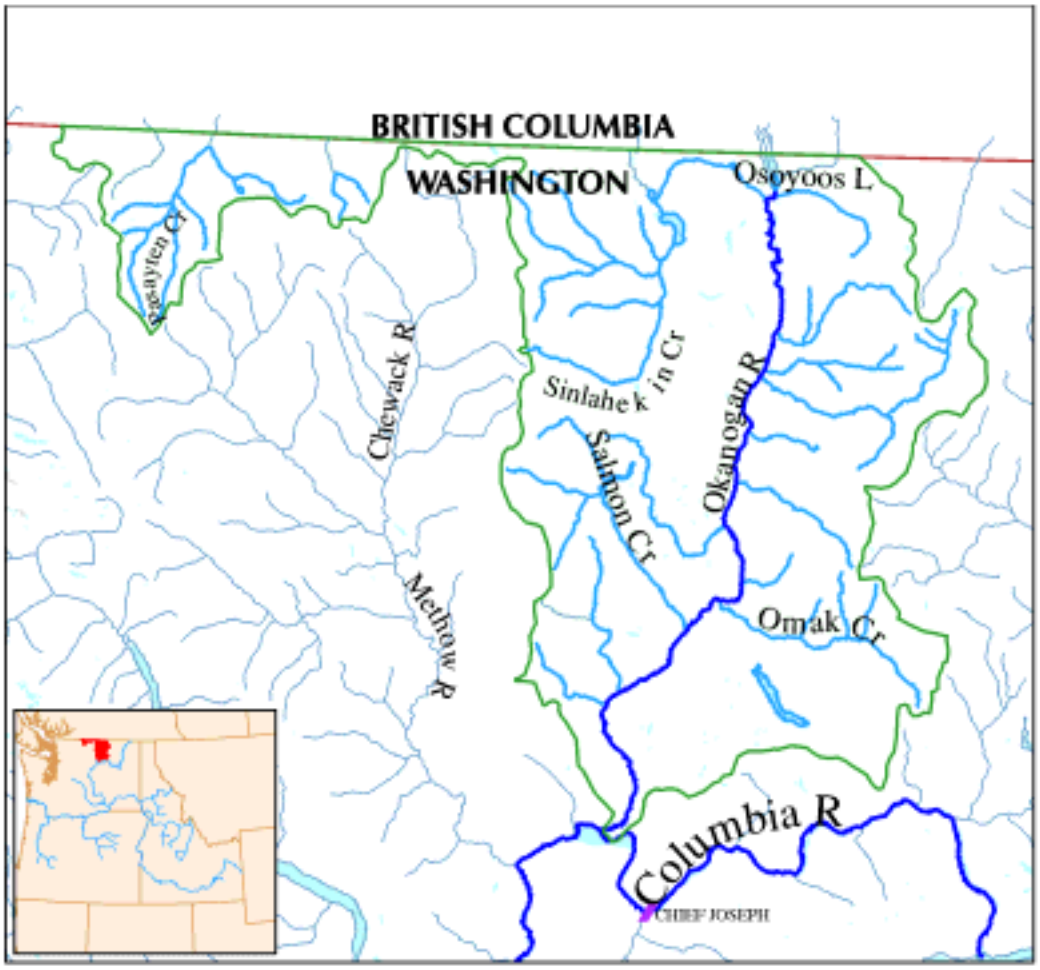
The broad strategy for rebuilding and protecting Methow River spring chinook combines habitat protection, passage improvements, harvest management restrictions and supplementation with artificial production. Specific strategies include improving habitat through the use of habitat restoration projects and passage improvements at barriers and the screening of irrigation diversions; and supplementing naturally spawning populations to enhance natural production and re-establish naturally producing runs.

Project #9603401 implements improvements to the Methow Valley Irrigation District's system that will improve flows for fish. Mainstem passage improvements for the mid-Columbia projects downstream of the Methow River are being implemented through the mid-Columbia Coordinating Committee with PUD funding. Lower Mainstem passage survival improvements are being pursued through Snake River Recovery planning efforts. Protection of existing spawning and rearing habitat in the upper reaches of the Methow and addressing factors that result in survival problems in summer rearing/overwintering in the lower tributary are important components of the Methow strategy. Protecting and improving in-stream flows is a critical component of the rebuilding strategy. Additional habitat protection activities are being developed and pursued through the mid-Columbia Habitat Conservation Plan currently under development.

Project #9604000 re-establishes coho to the Wenatchee and Methow through supplementation. This project covers the design and construction of rearing and acclimation facilities, O & M, and monitoring and evaluation. Additional supplementation activities are being funded by Chelan PUD through the Rock Island Dam Settlement Agreement

The Methow Valley Irrigation District (MVID) project improved water quality and quantity.

3. Okanogan Subbasin



The Okanogan Subbasin straddles Washington and British Columbia. The Okanogan River begins near Armstrong, British Columbia, and flows south through a series of lakes to the Columbia River where it enters between Wells and Chief Joseph dams. The Similkameen River, which enters the Okanogan River from the northwest approximately 75 miles above the mouth, is the main tributary and is primarily in Canada. Together, the Okanogan-Similkameen subbasin covers approximately 8,200 square miles, with 2,500 square miles in the United States. Nearly all of the subbasin experienced glaciation and is characterized by moderate slopes and broad, rounded summits.

The largest landowners in the subbasin are the Confederated Tribes of the Colville Reservation and the U.S. Forest Service. Forest, rangeland and irrigated agriculture are the dominant land uses. A diversion dam above Oliver, B.C. is the upper terminus to migratory fish. The Similkameen River is impassable at Enloe Dam, an abandoned power generation facility 8.8 miles above the confluence with the Okanogan River that

blocks access to more than 95% of the anadromous fish habitat in the Similkameen River, the Okanogan's largest tributary. Recently there has been interest in relicensing the Enloe Dam, as well as investigations of potential fish passage alternatives there.

The indigenous anadromous fish species most actively targeted for management in the Okanogan River Subbasin are spring chinook (extirpated) and summer chinook, sockeye, and summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The mainstem Okanogan suffers from extreme summer temperature, fine sediment, and low flow problems due to irrigation withdrawal. Stream bank erosion from overgrazing is found throughout the subbasin. Salmon Creek, once an important spring chinook stream, is now entirely diverted into an irrigation delivery system. Thermal and/or structural barriers exist on most tributaries within the subbasin.

In an attempt to meet the subbasin goal, the co-managers have adopted the following outcome-based objectives: 1. Improve adult pre-spawning survival; 2. Improve juvenile survival; and 3. Utilize supplementation to increase natural production.

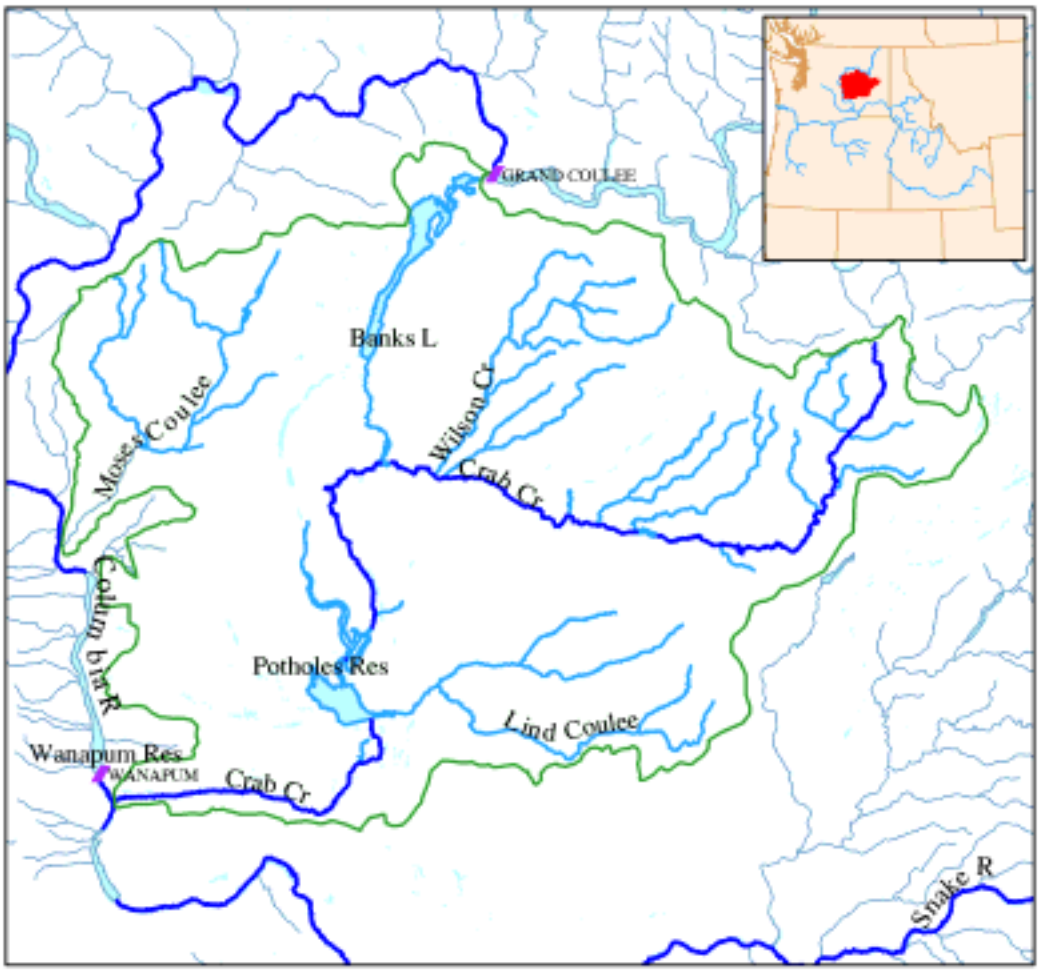
The broad strategy for rebuilding and protecting Okanogan spring chinook combines habitat protection, passage improvements, harvest management restrictions, and supplementation with artificial production. Specific strategies include improving habitat through the use of habitat restoration and passage improvements and supplementing naturally spawning populations to enhance natural production

#Project 9604200 funds the Colville Confederated Tribes to carry out Okanogan Watershed Planning and to implement habitat restoration. FY 1999 funding will address critical needs in Salmon Creek.

Protection of existing spawning and rearing habitat along with alleviation of survival problems in summer rearing/overwintering in the lower tributaries are critical objectives of the strategy. Specific recommendations of habitat protection activities are being developed and pursued through the mid-Columbia Habitat Conservation Plan currently under development. There is significant potential for increasing spawning and rearing habitat available to anadromous fish in this subbasin by addressing passage blocks such as Enloe Dam.

Supplementation is being implemented primarily through mid-Columbia PUD funding.

4. Crab Subbasin



Crab Creek headwaters in eastern Lincoln County near the town of Reardan, flows west into Grant County to enter Moses Lake. Moses Lake drains into Potholes Reservoir, an irrigation reservoir which feeds water to farmlands in Adams and Franklin counties. The surface flows exiting Potholes Reservoir do so through a canal, from which a small amount of water is shunted to Crab Creek at various points south of the reservoir. Crab Creek also picks up water from irrigation return flows (excess from crop fields) and various springs and lake drainages as it continues south and west to juncture with the Columbia River near Mattawa, Washington. The upper reach of Crab Creek (upstream of Moses Lake) typically dries up in the summer over most of its distance, whereas the reach south of Potholes Reservoir has perennial flow.

The entire subbasin is heavily compromised by irrigation influences, dry land farming, and cattle grazing. Little has been done to improve this to date, although efforts are

presently underway to develop long term watershed enhancement plans in a cooperative way with various agencies, private resource groups and landowners.

A rainbow trout fishery is maintained in a perennial section of the stream near Odessa, Washington, but from this point west there are either no fish (ephemeral flows) or carp, longnose and largescale suckers, sculpin and various centrarchids comprise most of the fish fauna. Only sculpin and suckers remain of the stream's indigenous fish species. A small amount of trout fishing (from hatchery fingerling releases) occurs in the creek as it nears Moses Lake (a distance of about six miles). Chinook salmon, steelhead trout, mountain whitefish and an array of centrarchids, cyprinids (mostly carp) and cottids utilize Crab Creek in its lower 20 miles, although anadromous fish and whitefish have only been found in low numbers up to about 10 miles above the mouth. Both steelhead and chinook occur during spawning seasons, but production of smolts is dubious because of poor water quality.

Moses Lake has no direct connection with the lower reach of Crab Creek and therefore management objectives for fish and wildlife have no impact on native fish in the lower Crab Creek basin (south of Potholes Reservoir). Historically, Moses Lake was managed primarily for production of crappie, bluegill, bass, perch, and rainbow trout. Along with Potholes Reservoir, the fisheries were unequaled anywhere in Washington State. Productivity began declining rapidly in the early 1980's and current recreational harvest is less than 15 percent of former levels. Much public attention has been drawn to the demise of this fishery and efforts have begun to review historical biological information as well as limited sampling of fish populations. The management objectives for Moses Lake remain essentially the same, but recapturing lost recreational benefits is hindered by insufficient information on all ecological and water management aspects of Moses Lake.

To improve fisheries in Moses Lake, the managers recommend Project #9502800 which will: 1) identify factors contributing to the fishery decline; 2) identify management actions that have the highest likelihood of restoring the recreational fishery; 3) implement these actions; and, 4) monitor and evaluate their success. The project will provide additional recreational angling opportunity for resident fish stocks in the Columbia Basin to compensate for the loss of recreational opportunity in the region as a result of hydropower development and operation. Inland fisheries for resident species also provides the ideal alternative angling opportunity for anglers restricted or displaced from their traditional fisheries on currently protected salmonid populations.

F. Upper Columbia Subregion

The Upper Columbia Subregion is defined as the Columbia River and its tributaries from Chief Joseph Dam to the headwaters within the United States. This subregion covers approximately 43,300 square miles and includes the following subbasins: Upper Columbia Mainstem, Spokane, Coeur D' Alene, Kootenai, Pend Oreille, Clark Fork, Flathead, Bitterroot, and Blackfoot.

The Upper Columbia Subregion consists of the Columbia River Watershed upstream from Chief Joseph Dam to the headwaters in Montana.

Both resident fish mitigation and resident fish substitution measures are implemented throughout the subregion to meet system goals of protecting, mitigating, and enhancing the health and viability of resident fish populations to meet consumptive and non-consumptive needs. Specific goals of resident fish managers throughout the subregion include: 1) mitigate and compensate for resident and anadromous fish losses caused by the construction and operation of federally-regulated and federally-operated hydropower projects; 2) ensure the continued persistence, health, and diversity of existing resident

fish species by reducing or removing impacts caused by habitat degradation (including water quality, water quantity, and hydropower development), competition and/or hybridization with non-native species, and over-harvest (direct and incidental); 3) restore native resident fish species (subspecies, stocks and populations) to near historic abundance throughout their historic ranges where habitats exist and where habitats can be feasibly restored; 4) maintain and restore healthy ecosystems and watersheds which preserve functional links among biota to ensure the continued persistence, health and diversity of all species including game fish species, non-game fish species, and other organisms; and, 5) administer and increase opportunities for consumptive and non-consumptive resident fisheries for native, introduced, wild, and hatchery-reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance (includes intensive fisheries within closed or isolated systems).

The specific wildlife mitigation goal for the Upper Columbia River Subregion is to fully mitigate for the wildlife losses caused by the construction and operation of the hydroelectric projects located in the subregion. These hydro projects are listed below, with the estimated construction losses and habitat mitigation priorities as listed in the NPPC's Fish and Wildlife Program.

Upper Columbia Subregion HU Losses by Hydro Project	
Hydro Project	**HU loss**
Grand Coulee	111,785
Chief Joseph	8,833
Albeni Falls	28,658
Total	**149,276**

Upper Columbia Subregion Wildlife Mitigation Priorities	
Habitat Type	**Priority**
Riparian/River	High
Shrub-Steppe	High
Wetlands	High
Islands	Medium
Agricultural Lands	Low

The wildlife mitigation objectives in the Upper Columbia Subregion are consistent with the overall objectives outlined in the introduction to Section IV of this workplan.

The wildlife mitigation strategies in the Upper Columbia Subregion are to:

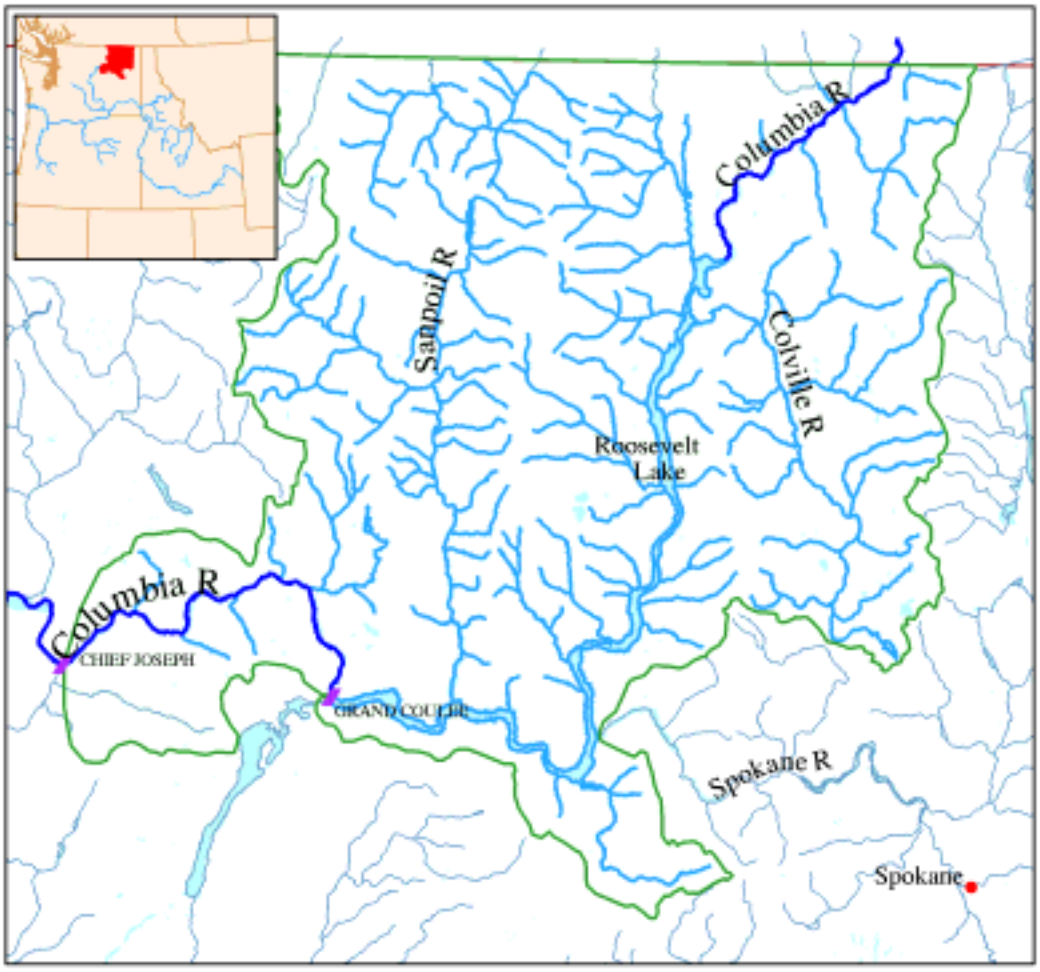
1. Continue regional coordination of Albeni Falls mitigation through the Albeni Falls Working Group.

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9106000	Kalispel Pend Oreille Wetlands Wildlife Mitigation Project	KT	Pend Oreille	Albeni Falls	1,217
9106100	WDFW Projects	WDFW	Yakima	see project 9609400	see project 9609400
9204800	Hellsgate Big Game Winter Range	CCT	Upper Columbia Mainstem	Chief Joseph, Grand Coulee	12,884
9206100	Albeni Falls Wildlife Mitigation Project	IDFG	Upper Columbia Mainstem	Albeni Falls	717
9800300	O & M Funding of Wildlife Habitat on STOI Reservation for Grand Coulee Dam	STOI	Upper Columbia Mainstem	Grand Coulee	1,695

It is expected that estimated losses due to hydropower construction will be fully mitigated for by the activities of ongoing projects and projects implemented in the future. The following projects have been proposed for FY 1999:

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9013	Hellsgate Big Game Winter Range Continuing Acquisition	CCT	Upper Columbia Mainstem	Grand Coulee	To be determined
9116	Rasor Ranch Acquisition/Crab Creek Watershed Restoration Project	USFWS/ CNWS	Upper Columbia Mainstem	Grand Coulee	1000
9004401	Lake Creek Land Acquisition and Enhancement	CDA Tribe	Coeur d'Alene	Albeni Falls	760
9206100	Albeni Falls Wildlife Mitigation Project	IDFG	Upper Columbia Mainstem	Albeni Falls	1,050

1. Upper Columbia Mainstem Subbasin



The subbasin location is in the Upper Columbia Sub-Region above the "blocked area" created by the construction of Chief Joseph and Grand Coulee Dams, upstream to the Canadian Boarder. The subbasin includes waters within the Colville Indian Reservation, Spokane Indian Reservation and the State of Washington. Specific waters are subject to cooperative fisheries management by two or three of the aforementioned management agencies.

The construction of Chief Joseph and Grand Coulee Dams completely and irrevocably blocked anadromous fish migrations to the Upper Columbia River Sub-Region (area above Chief Joseph Dam). Prior to hydropower development the areas above the current "blocked area" supported a large diverse fish population, including eleven salmonid stocks (Scholz et al. 1985). The complete extirpation of anadromous fish stocks from this area reduced the native salmonid species assemblage by approximately 64 percent and forever changed the culture, religion and livelihood of the Native Americans that were dependent upon the once abundant anadromous fish resource.

Resident fish species in the subbasin were also impacted through habitat alteration (inundation) lost productivity (absence of nutrient component attributable to anadromous fish) and habitat degradation relating to land-use practices (agriculture, grazing, logging and municipal development) largely made possible by hydropower development in the region. The species/stock assemblages present in subbasin have adapted to survive in marginal salmonid habitat and have been present for many years. The potential for natural production (native or non-native species/stock) has been reduced in many of the associated watersheds through poor land use practices and elimination of the anadromous fish nutrient component. The current salmonid species within the subbasin are exclusively resident fish and contain limited native species assemblages. Primary target resident fish species include the following native species: bull trout, burbot, kokanee, rainbow trout (redband and adfluvial rainbow), westslope cutthroat and white sturgeon. Primary non-native species /stock include: lahontan cutthroat trout, brook trout, kokanee, rainbow trout, walleye, yellow perch and smallmouth bass.

The fish management goal in the subbasin is to provide a successful tribal subsistence fishery and a non-member recreational sport fishery consistent with the Council's 1994 Fish and wildlife System Goal of "a healthy Columbia River Basin, one that supports both human settlement and the long-term sustainability of native fish and wildlife species in native habitats where possible, while recognizing that where impacts have irrevocably changed the ecosystem, we must protect and enhance the ecosystems that remains. To implement this goal the program will deal with the Columbia River as a system; will protect mitigate and enhance fish and wildlife while assuring an adequate, efficient, economical and reliable power supply; and will be consistent with the activities of the fish agencies and tribes." Subbasin objectives guiding project specific objectives, strategies and actions include: (1) protect, maintain, and enhance native fish populations and their habitats; (2) protect, maintain, and enhance non-native fish populations consistent with native fish species conservation; (3) establish, maintain, and enhance fish assemblages (both native and non-native species complexes) which maximize ecosystem productivity and stability -- while providing sustainable consumptive and non-consumptive resident fisheries; (4) replace lost fisheries, including subsistence fisheries for the region's Indian Tribes, with the appropriate native or non-native resident fish populations (depending on type and availability of habitat, food, and other species present); (5) conduct research to better understand critical uncertainties and to determine the best methods for resident fish protection and enhancement and (6) monitor and evaluate actions designed to enhance resident fish populations in order to maximize the cost-effectiveness of the overall resident fish program, and to maximize subbasin resident fisheries opportunities. The long-term viability of native and non-native resident fish will be enhanced through conservation and consumptive and non-consumptive management objectives and identified in the Resident Fish Multi-year Implementation Plan (CBFWA 1997).

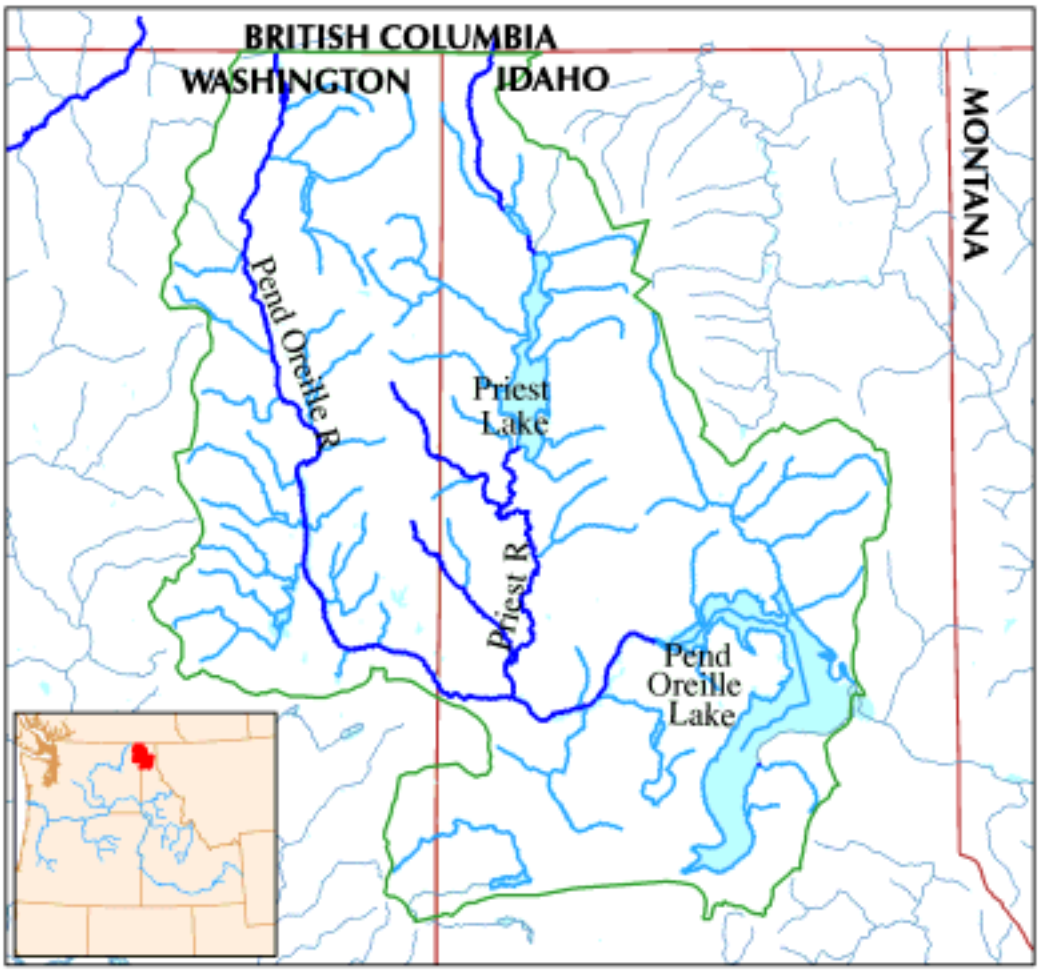
Numerous project specific strategies to achieve project and subbasin objectives have been identified in the Resident Fish Multi Year Implementation Plan (RFMYIP) and can be grouped into several general categories including the following: (1) develop and identify

specific reservoir operations management plan for Lake Roosevelt to enhance resident fisheries; (2) initiate watershed management activities necessary for habitat enhancement that will facilitate the natural production of native and non-native fish species; (3) conduct stock assessments, angler surveys, and population inventories (both adult and juvenile) to estimate population strength, population dynamics, and fishery quality over time (population trends); (4) utilize artificial production to enhance native and non-native fish populations consistent with native species conservation; (5) maintain harvest regulations that protect natural production fish populations (native and non-native) while maximizing the contribution of hatchery origin stocks and (6) monitor effects of specific strategies and actions towards meeting subbasin objectives and (7) implement specific management actions within the subbasin in a cohesive, cooperative and integrated fashion.

The three management agencies with fisheries management responsibility within the subbasin have initiated numerous projects through the Northwest Power planning Councils fish and wildlife Program to partially mitigate for the loss of anadromous fish due to the federal hydropower system utilizing resident fish (resident fish substitution). These projects have enhanced the resident fishery (both native and non-native) in the "blocked area" through habitat/passage improvements (Lake Roosevelt Rainbow Trout Habitat/Passage Improvement project, #9001800); stock assessment activities, (Habitat/Passage Improvement project,#9001800, Chief Joseph Kokanee Enhancement Project, #9501100 and Lake Roosevelt Fisheries Monitoring Program, #944300); artificial production enhancement activities (Colville Tribal Fish Hatchery, #8503800, Spokane Tribal Hatchery, #9104600, Sherman Creek Hatchery, #9104700 and Lake Roosevelt Rainbow Trout Net Pens, #9500900) and cooperative resource management (Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams, #9700400).

The enhancement of native fish species in applicable habitats and enhancement of non-native species in altered habitats consistent with native species conservation to provide for sustainable subsistence and recreational fisheries. The enhancement efforts in the "blocked area" will partially mitigate for irrevocable anadromous fish losses due to construction and operation of Chief Joseph and Grand Coulee Dams. Resource management that is implemented utilizing the best available science in a cooperative, coordinated and integrated fashion within the subbasin and basin to maximize the greatest benefit for the effort expended.

2. Pend Oreille Subbasin



The Lower Pend Oreille Subbasin is located in the Upper Columbia Subregion and consists of the Pend Oreille River watershed from Albeni Falls Dam (upstream) to the Canadian border (downstream). Throughout the subbasin, native resident fish will be the priority for management if habitat conditions can be adequately maintained to sustain genetic diversity and species persistence. In areas where such habitat conditions do not exist, alternative management strategies will be implemented to maximize available habitats and harvest opportunities. The subbasin is broken into four management types, each with their own physical habitat conditions and corresponding management approach.

The Upper Pend Oreille subbasin is managed in two distinct units: the Upper Pend Oreille (above Albeni Falls) and the Lower Pend Oreille (Albeni Falls to the Canadian border).

The Upper Pend Oreille Drainage has undergone several adverse physical changes in the last century that were largely due to the federal hydropower system. In 1952, the US Army Corps of Engineers built, and now operates, the Albeni Falls Dam. During the same year, Washington Water Power built the Cabinet Gorge Dam which is a federally licensed project. Operation of Albeni Falls Dam changed the natural cycle of lake elevations on Lake Pend Oreille. These changes caused significant losses of shoreline spawning areas, shoreline erosion, reductions in aquatic plant production, and elimination of much of the fish habitat in the Pend Oreille River between Albeni Falls Dam and Sandpoint, Idaho. Cabinet Gorge Dam has caused additional impacts to this drainage. It is a fish barrier blocking much of the drainage from spawning fish. It has also been found to produce dissolved gasses well in excess of the State's standard which affects the north end of Lake Pend Oreille and the Clark Fork and Pend Oreille rivers. These changes have impacted many species including bull trout, cutthroat trout, kokanee, Kamloops rainbow trout, and several species of warm water fish. These impacts have affected the viability of native populations as well as sharply reduced economically important sport fisheries.

The subbasin goal for the Pend Oreille drainage is to mitigate for resident fish losses caused by the construction and operation of Albeni Falls and Cabinet Gorge Dams. This is to be accomplished by improving the ecosystem, changing dam operation to minimize impacts, recovering native fish communities, and improving the currently established sport fisheries.

To achieve this goal in the Pend Oreille River Subbasin, fish managers and researchers have defined several broad strategies. The strategic intent is to focus research on addressing critical uncertainties of habitat changes caused by dam operation, to then develop and implement recovery plans, protect and enhance aquatic habitat within this drainage, and to improve and monitor the existing sport fisheries.

Specific actions for these strategies include: 1) determine the effects of water elevation changes caused by Albeni Falls Dam on the shoreline spawning habitat and warm water fish habitat in the Pend Oreille river and Lake Pend Oreille; 2) implement beneficial changes to the rule curves of Albeni Falls Dam: 3) identify historic and current stocks, population levels, life history and habitat conditions; 4) determine the effects of gas supersaturation problems in the lake and rivers and implement solutions; 5) improve tributary streams to enhance spawning and recruitment of native fish; 6) propagate important sport fish and native species in hatcheries and net pens; 7) research and monitor natural reproduction, recruitment, and harvest of fish stocks; and, 8) coordinate habitat improvements on public and private land.

The Lower Pend Oreille Subbasin is located in the Upper Columbia Subregion and consists of the Pend Oreille River watershed from Albeni Falls Dam (upstream) to the Canadian border (downstream). Throughout the subbasin, native resident fish will be the priority for management if habitat conditions can be adequately maintained to sustain

genetic diversity and species persistence. In areas where such habitat conditions do not exist, alternative management strategies will be implemented to maximize available habitats and harvest opportunities. The subbasin is broken into four management types, each with their own physical habitat conditions and corresponding management approach.

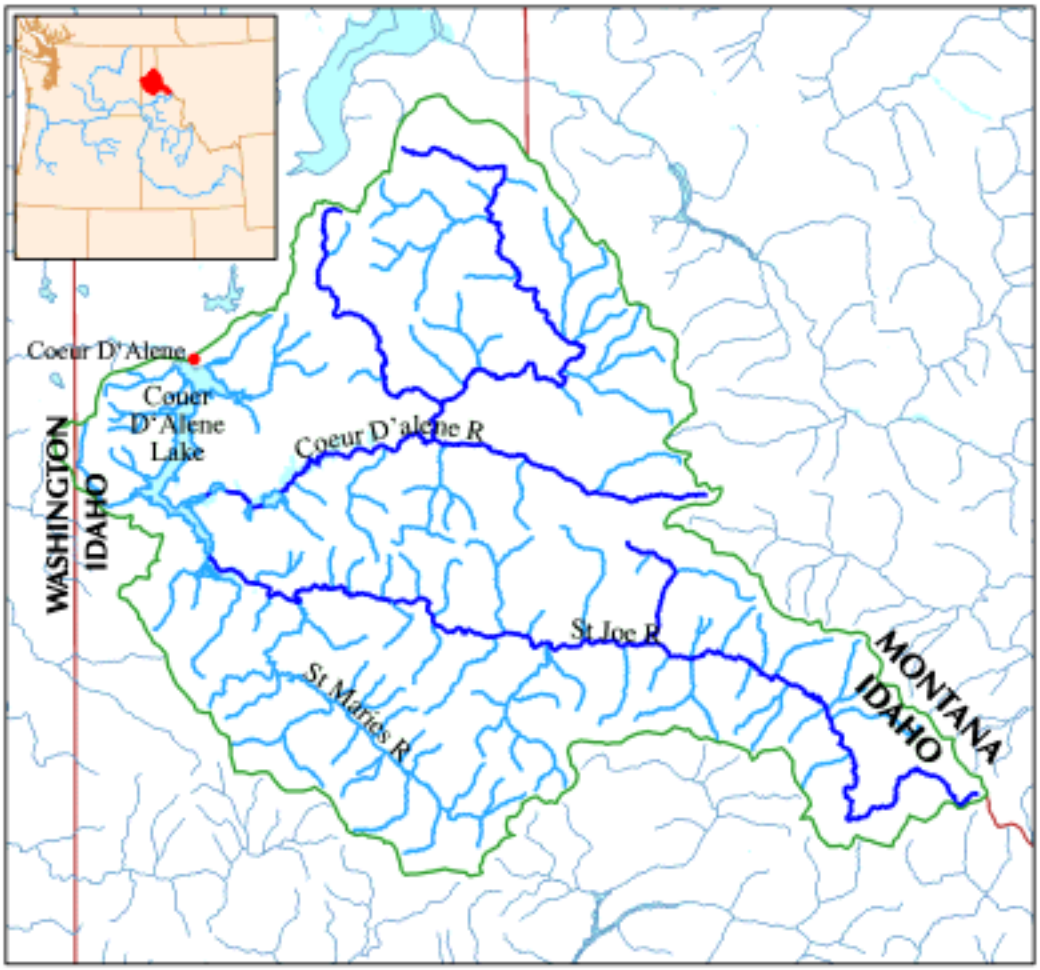
1) Box Canyon Reach of the Pend Oreille River: Hydroelectric development has changed this reach from free flowing, coldwater fluvial habitat to a shallow, slow flowing, unstratified warmwater lacustrine environment. Due to these altered habitat conditions management actions focus on largemouth bass, brown trout, mountain whitefish, non-game species, and other non-native species tolerant to altered habitat conditions.

2) Pend Oreille River tributaries: Habitat conditions in tributaries of the Pend Oreille River are conducive to restoring and enhancing healthy native assemblages. Tributary management focuses on bull trout, westslope cutthroat, sculpin, suckers, and mountain whitefish.

3) Pend Oreille River below Box Canyon Dam: Management strategies are currently being developed based on information being collected. This stretch of river has significantly different habitat characteristics from the Box Canyon Reach and an unknown species assemblage.

4) Lakes throughout the Lower Pend Oreille Watershed: Lakes management will be considered on a case by case basis based on habitat characteristics, native species impacts, species assemblages, and harvest objectives. Species currently being managed for in lakes include, but are not limited to, burbot, westslope cutthroat, rainbow trout, brook trout, kokanee, Pygmy whitefish and brown trout.

3. Coeur d'Alene Subbasin



Westslope cutthroat trout were an abundant and extremely important resident fishery for the Coeur d' Alene Indians, and were once the most abundant trout species in the Coeur d' Alene system. Since 1932, the cutthroat population has declined significantly. The present riverine conditions bear little resemblance to the composition, diversity, and structure of historic rivers and streams.

Dramatic effects on riparian/stream ecosystems have resulted from trapping, livestock grazing, dam construction, logging, mining, the introduction of exotic species, channelization, urbanization, road construction, irrigation withdrawals, etc. In many instances, habitat degradation and consequent reduction in native trout populations have resulted from the cumulative effects of small changes to the aquatic ecosystem. Over time, these cumulative effects may be the most harmful to native fisheries because of their potential to alter ecosystem processes. Thus, anthropogenic disturbance can significantly

alter the productivity of ecosystems by adversely affecting species composition and diversity. Accordingly, the focus of interest is restoration of an ecosystem characterized by declines in biological diversity and ecosystem productivity.

The following generalized goals and objectives have been identified for the Coeur d' Alene subbasin. Project number 900440-Fisheries Habitat Evaluation in Tributaries on the Coeur d'Alene Indian Reservation and project number 904401-Lake Creek Land Acquisition directly address the above sub-basin goals:

1) Rehabilitate and maintain continuous, healthy riparian corridors which support the full range of ecological and hydrological processes.

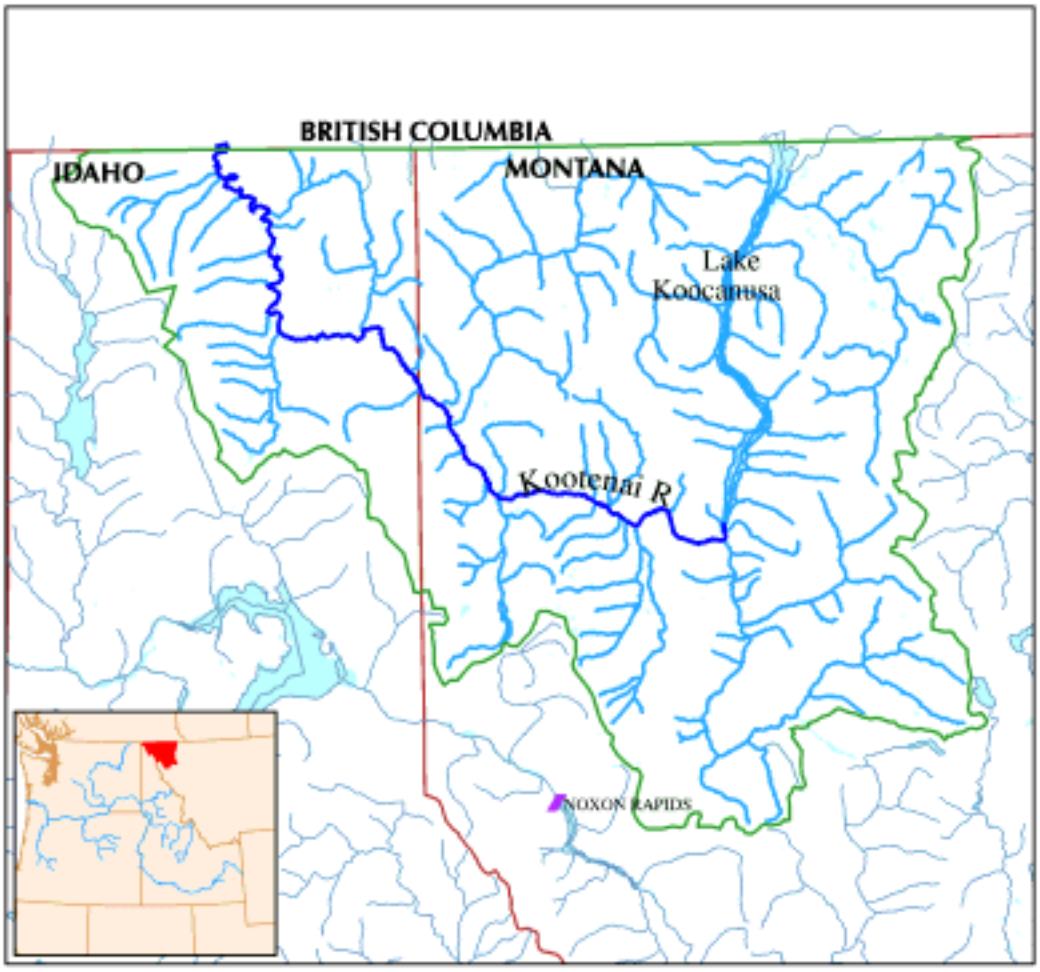
2) Reestablish and protect self-sustaining populations of native cutthroat and bull trout which were historically prominent in the Lake Coeur d' Alene system.

3) Manage the riparian/aquatic interface for both wildlife and limited domestic use, while protecting water quality, public health, and the fisheries resource.

4) Develop agreements with private landholders to implement site specific restoration projects and encourage commitments to cost-sharing opportunities.

5) Provide harvest opportunities to give restoration efforts a chance to take hold and provide protection of depressed westslope cutthroat trout populations.

4. Kootenai Subbasin



The Kootenai River has undergone many adverse physical and chemical changes in the last century, the most recent of which was the construction and operation of Libby Dam. Operation of Libby Dam and the impoundment (Lake Koocanusa) changed the hydrograph, water temperatures and nutrient cycling of the river. Many native species were affected by the dam, including white sturgeon, burbot, rainbow, cutthroat, bull trout, mountain whitefish, and kokanee. All of these species have been cited as important resident fish in the 1995 Fish and Wildlife Program.

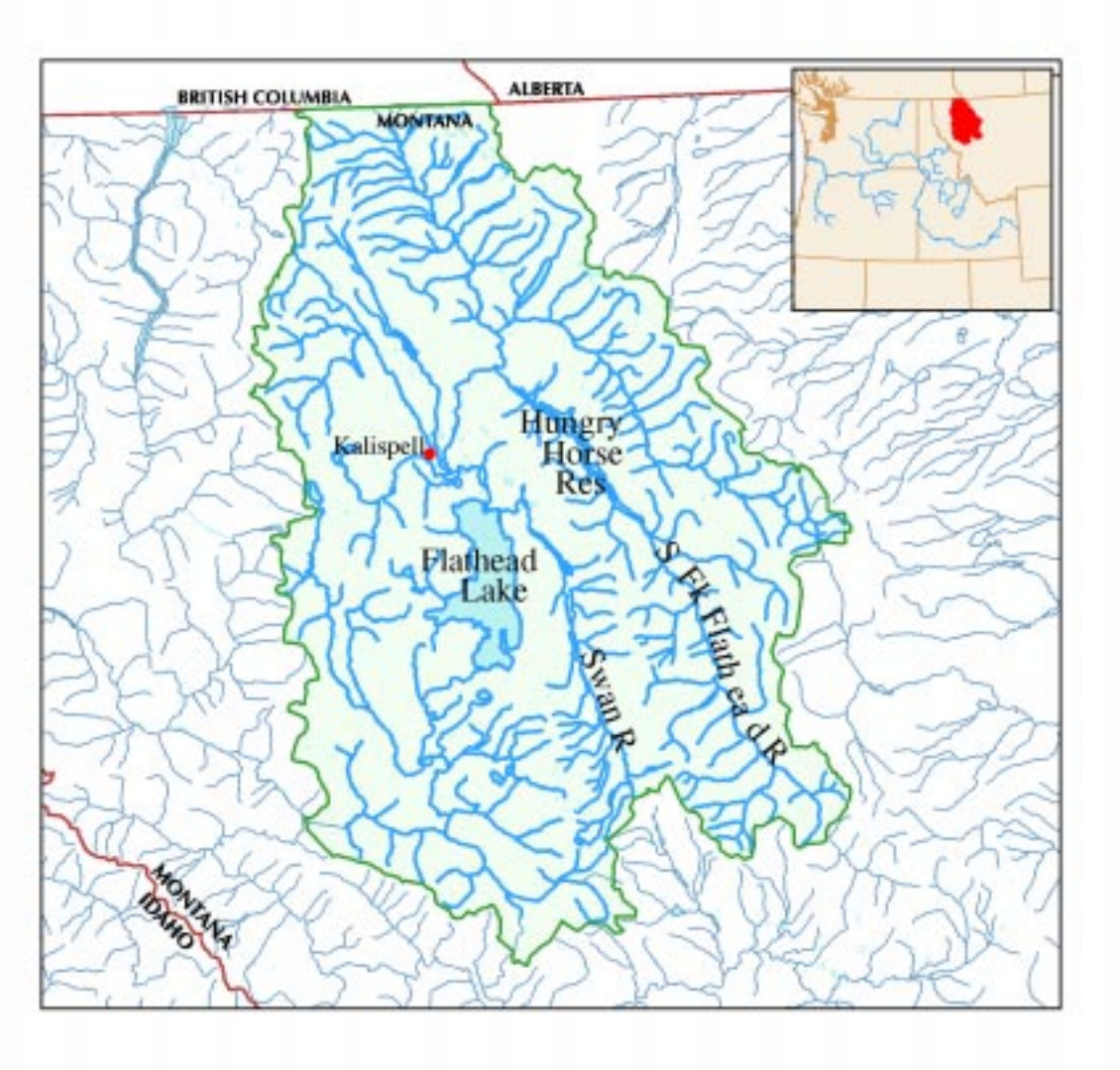
The subbasin goal for the Kootenai drainage is to mitigate for resident fish losses caused by the construction and operation of Libby Dam by improving the ecosystem and recovering the fish community to self-sustained levels.

To achieve management objectives for the fish species of interest in the Kootenai River Subbasin, fish managers and researchers have defined several broad strategies. From a

population perspective, the strategic intent is to maintain and enhance production, adjust flows to create suitable spawning conditions, maintain genetic diversity and adaptiveness, and re-establish populations where appropriate. From a managers perspective, the strategic intent focuses on learning more about the condition of existing fish populations and the habitat by hypothesis testing where needed, developing and implementing recovery plans, protecting and enhancing the habitat, creating harvest opportunities, and managing angling demand consistent with healthy fish populations.

Specific actions implemented to meet these strategies include: 1) identify historic and current stocks, population levels, and habitat conditions; 2) implement Integrated Rules Curves and a tiered flow approach at Libby Dam to restore normative conditions and aid natural recruitment for native fish; 3) correct fish passage problems; 4) implement conservation aquaculture, imprint planting, native species reintroductions, and population enhancement where appropriate; 5) research and monitor natural reproduction and recruitment; 6) coordinate habitat improvements on private land; and, 7) assess the ecosystem, developing a predictive model to estimate trophic responses to a range of hypothetical management options for the ecosystem.

5. Flathead Subbasin



The Flathead Drainage in Montana has experienced a severe decline in the range and number of both native bull trout and westslope cutthroat trout. Construction of Hungry Horse Dam inundated 77 miles of critical, low-gradient spawning and rearing habitat. Hydropower development eliminated 40 percent of available steam habitat in the subbasin. Hydropower operations causes inappropriate seasonal fluctuations in the reservoirs and rivers downstream resulting in reduced biological production.

Legal and illegal species introductions, forest management, agriculture, urbanization, and other land use activities have caused many streams in the drainage to become remarkably unstable. The result is increasing watershed fragmentation. Watershed management and fisheries management goals exist to rectify this situation. The subbasin goal is to mitigate for resident fish losses caused by the construction and operation of Hungry Horse Dam and the federal hydropower system and improve sport fishing opportunities

as compensation. The goals are consistent with those outlined in the Hungry Horse Fisheries Mitigation and Implementation Plans, the Multi-Year Implementation Plan as well as in both the Upper Flathead System Fisheries Management Plan and the Fisheries Management Plan for the Flathead Indian Reservation.

From a watershed perspective, the subbasin objective is to achieve ecosystem equity. This approach is necessary to reverse the downward trends in native species and protect healthy populations within the Flathead River Watershed. Subbasin strategies to obtain this objective are to use a balanced system-wide approach treating the basin as a whole. In other words, treat the degradation causes, not the symptoms. Habitat improvements on private lands will be coordinated through the Focus Watershed Program in the Flathead watershed. "Grass roots" public involvement and interagency cooperation will be used to attain locally lead watershed recovery plans. These methods provide the greatest chance of success for the recovery of fisheries resources.

From a fisheries perspective, the subbasin objectives are to foster and maintain wild, self sustaining populations of fishes (particularly native westslope cutthroat and bull trout) in applicable drainages and to increase harvest and use of these species within the Flathead watershed. Subbasin strategies include: maintaining minimum instream flows throughout the watershed; implementing Integrated Rule Curves and discharge ramping rates at Hungry Horse Dam to restore normative river conditions; restoring habitat from a watershed standpoint; using imprint plants and remote site incubators to seed existing and restored habitats, using experimental hatchery techniques to hatch and rear native species at low densities (taking all steps necessary to maintain genetic integrity).

Fisheries mitigation activities associated with the construction and operation of Hungry Horse Dam began in 1992. Habitat restoration efforts have been completed and are ongoing within the upper Flathead watershed. Kokanee reintroduction was attempted in Flathead Lake and that program has now shifted to using experimental hatchery techniques to hatch and rear native species at low densities for restoration stocking. Monitoring and evaluation of restoration techniques and fish population responses continues. Cooperative programs and projects have been established with a variety of other entities. The program has been coordinated with ongoing agency management and regulatory activities to redirect angling pressure and harvest through public education.

In its first ten months, the Confederated Salish and Kootenai Tribes Watershed Program (begun in 1997) has begun coordinating and assisting in several local projects including Dayton Creek, east and south forks of Valley Creek, Marsh Creek, and the Jocko River. The watershed coordinator has worked closely with the Flathead Basin Commission, Bull Trout Restoration Team, Lake, Lincoln, Sanders, and Flathead County Conservation Districts, NRCS personnel, Tribal personnel and several locally lead community interest groups.

G. Lower Snake Subregion

The Lower Snake Subregion is defined as the Snake River and its tributaries from the mouth of the Snake to Hells Canyon Dam. This subregion covers approximately 35,200 square miles and includes the following subbasins: Lower Snake Mainstem, Tucannon, Asotin, Clearwater, Grande Ronde, Salmon, and Imnaha.

The Lower Snake River Subregion consists of the Snake River and its tributaries from its mouth at the confluence with the Columbia River upriver to Hells Canyon Dam. The major tributaries, are the Tucannon, Asotin Creek, Grande Ronde, Imnaha, Salmon, and Clearwater rivers.

The goal is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The specific wildlife mitigation goal for the Lower Snake Subregion is to fully mitigate for the wildlife losses caused by the construction and operation of the hydroelectric projects located in the subregion. These hydro projects are listed below, with the estimated losses due to hydropower construction and habitat mitigation priorities as listed in the NPPC's Fish and Wildlife Program.

Lower Snake Subregion HU Losses by Hydro Project	
Hydro Project	**HU loss**
Dworshak	28,452
Lower Snake Projects	26,774
Total	**55,226**

Lower Snake River Subregion Wildlife Mitigation Priorities	
Habitat Type	**Priority**
Riparian/Riverine	High
Wetlands	High
Native Grasslands and Shrubs	Medium
Coniferous Forest	Medium
Old Growth Forest	Medium
Lowland Forest	Low

The wildlife mitigation objectives in the Lower Snake Subregion are consistent with the overall objectives outlined in the introduction to Section IV of this workplan.

The wildlife mitigation strategies in the Lower Snake Subregion are to:

1. Determine unmitigated losses remaining in Lower Snake.
2. Highest priority for mitigation actions is given to Nez Perce and Yakama Tribes.

Past Accomplishments

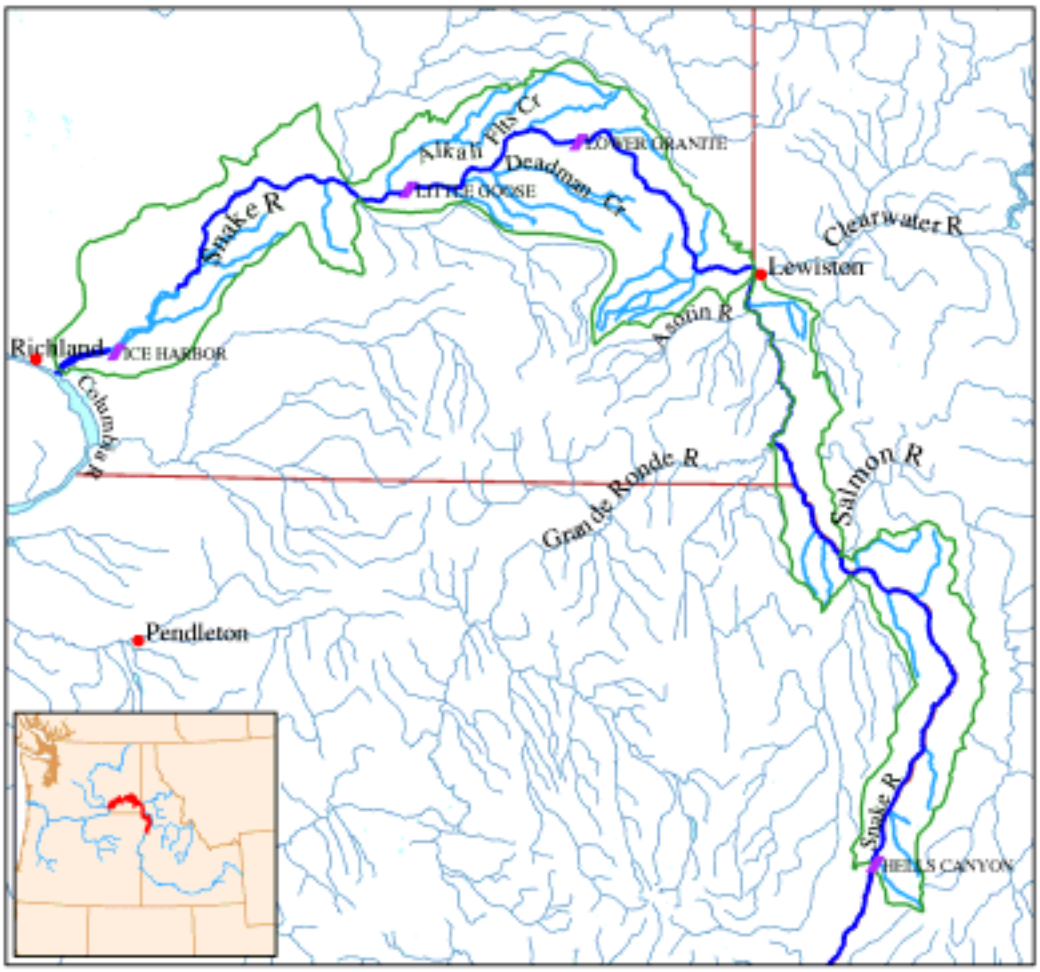
Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9608000	Northeast Oregon Wildlife Mitigation Project	NPT	Grande Ronde	Lower Snake	10,000

Expected Outcomes

It is expected that recommended projects (listed below) and future projects will fully mitigate the wildlife losses caused by the construction of the hydropower system.

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9705905	OWC - Ladd Marsh WMA Additions	ODFW	Grande Ronde	McNary	200-300
9705912	OWC - Wenaha WMA Additions	ODFW	Grande Ronde	McNary	700 - 1,500

1. Lower Snake Mainstem Subbasin



The Lower Snake River mainstem subbasin extends from Hells Canyon Dam in Idaho to the confluence of the Snake and Columbia rivers in eastern Washington, a distance of about 250 river miles. The mainstem is accessible to anadromous fish only as far upriver as Hells Canyon Dam. There are four federal dams on the lower Snake River, which have a major impact on the subbasin: Ice Harbor, Lower Monumental, Little Goose and Lower Granite.

Major land uses in the subbasin are wilderness and agriculture, with some logging in the tributaries. About 17 percent of the land in the Washington portion of the subbasin is managed by the U.S. Forest Service; 38 percent is rangeland and 40 percent is cropland. The upper subbasin has Forest Service, private and Bureau of Land Management Lands. The upper-most portion contains most of the Hells Canyon National Recreation Area,

part of which is designated as wilderness. This also includes a part of the Snake that is designated a Wild and Scenic River.

The indigenous anadromous fish species most actively targeted for management in the Lower Snake River Mainstem Subbasin are fall chinook, spring and summer chinook, and summer steelhead. Coho were extinct in 1986, and re-introduction efforts have been initiated. Little is known about the existing Pacific lamprey populations, and white sturgeon is a species of concern. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The primary limiting factors are loss of spawning and rearing habitat related to reservoir development, passage losses of both juveniles and adults at mainstem dams and reservoirs, and an altered hydrograph below Hells Canyon Dam.

The co-managers have adopted the following outcome-based objectives to address problems salmon face during their life in the lower Snake River mainstem include: 1) improve survival of juvenile salmonids; 2) reduce pre-spawning mortality of adult salmonids; 3) improve spawning success; and, 4) supplement with genetically-appropriate fall chinook salmon.

Broad strategies to implement actions in an attempt to achieve the objectives include: 1) continuing fall chinook supplementation using Lyons Ferry stock; 2) developing adult capture and juvenile acclimation/release facilities in the Asotin Creek and Pittsburgh Landing areas on the Snake River and selected tributaries to support future broodstock collection and smolt release activities; 3) continuing the summer steelhead program at Lyons Ferry Hatchery using Lyons Ferry stock and the Oxbow program using adults collected at Hells Canyon Dam; 4) begin a natural broodstock summer steelhead program in Asotin Creek (the program should be phased in with releases occurring as production becomes available); 5) develop adult capture and juvenile acclimation/release facilities in Asotin Creek to support future broodstock collection and smolt release activities; 6) discontinue all catchable trout programs in areas where they may jeopardize anadromous restoration activities; 7) develop a program to restore lamprey populations utilizing either transplantation or artificial propagation, under the overall leadership of the affected tribes; 8) monitor and evaluate all artificial production actions; 9) use adaptive management to determine whether program changes (i.e., release number, size, time, location, and/or life history) are needed in order to meet restoration objectives; and, 10) support and track the PATH effort for assessment of fall, spring and summer chinook and summer steelhead response to breaching the lower four Snake River dams. The DFOP analysis in NMFS's Biological Opinion for fall chinook demonstrated a very quick response (recovery in several generations) with a four pool drawdown to natural river.

Specific actions which implement these strategies include: monitoring and evaluating wild juvenile Snake River spring/summer chinook outmigration (#9102800); and monitoring and evaluating the spawning distribution of fall chinook (#9801003) and the

rearing and migration of yearling fall chinook upstream of Lower Granite Dam (#9801004). Project #9801005 funds the development and operations of fall chinook acclimation facilities at Pittsburg Landing, Captain John Rapids, and Big Canyon.

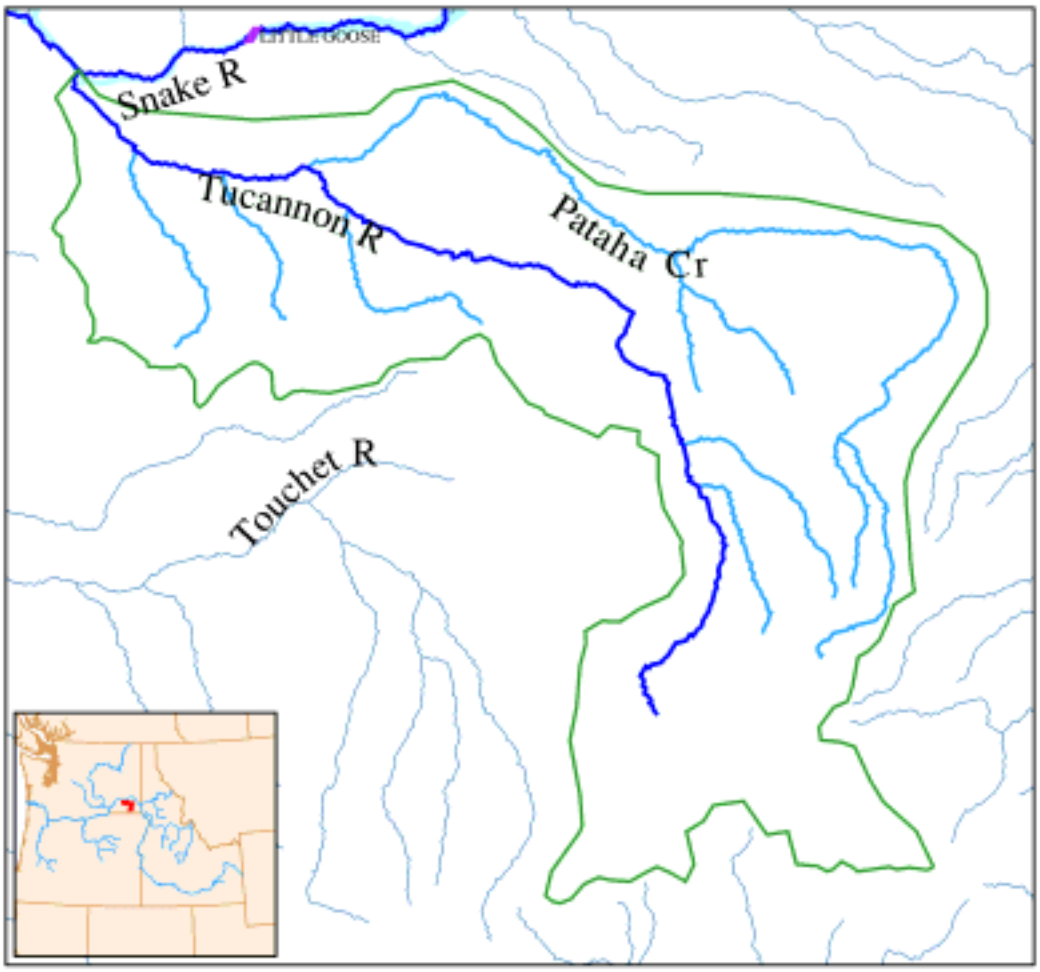
Considerable research and monitoring is being (and has been) done, including studies of fall chinook life history (#9102800, # 9102900), one summer/fall chinook restoration project (#9403400), juvenile fall chinook survival studies (#9801003), and several monitoring studies (#8000200, #8611900, #9204600, #9401004).

The primary native resident fish species targeted for active management in the Lower Snake Subbasin is the white sturgeon. Five regional goals were captured in the Resident Fish Multi-year Implementation Plan (RFMYIP) appendix to the June 4, 1997, Resident Fish Annual Implementation Work Plan (CBFWA 1997). The intent of these goals are two-fold: 1) to conserve, protect and enhance production and distribution of these species throughout their historical range; and, 2) to provide sustainable fisheries, including harvest opportunities. Within the Lower Snake Subbasin, fisheries managers intend to achieve these goals by effecting management objectives that address characteristics of fish populations and fisheries, distribution range, and fisheries characteristics. These objectives, also described in the RFMYIP, include: 1) maintaining and restoring population productivity reduced by hydropower development and operations to healthy levels which provide for consumptive and nonconsumptive uses of native population; and, 2) ensuring sustained population levels of native fish above the minimum viable population sizes which maintain adaptability and genetic diversity. Specific and directed strategies to achieve these objectives for the Lower Snake Subbasin have been identified by the fisheries managers, and are also detailed in the RFMYIP. These strategies include the following: 1) configure and operate the hydropower system consistent with the salmonid recovery plan to maximize spawning and rearing success of white sturgeon; 2) Supplement with artificial production where risks to naturally spawning populations are negligible if abundance of naturally produced white sturgeon cannot be restored to pre-hydrosystem levels; 3) monitor population status of white sturgeon to evaluate effectiveness of restoration efforts and conduct research as needed to ensure success of restoration efforts; and, 4) manage harvest of white sturgeon at the population level based on estimated abundance and exploitation rates which provide optimum sustainable yields.

In 1996, a biological risk assessment of white sturgeon in the Lower Snake River between Hells Canyon and Lower Granite Dams was conducted by the Nez Perce Tribe (Project #9700900). This assessment identified: 1) regional sturgeon management objectives; and, 2) potential mitigation actions needed to restore and protect the population. The risks and uncertainties associated with implementation of potential mitigative actions could not be fully assessed, however, because critical data concerning the status of the population and their habitat requirements are unknown. The tribe is currently collecting the missing data. Based on results of the data collection, an adaptive management plan will be formulated that will: 1) reassess potential mitigative actions; 2) recommend the implementation of needed mitigative action(s); and, 3) present a monitoring and evaluation plan.

The expected outcome of identifying and implementing appropriate mitigative actions to rebuild the white sturgeon population in the Lower Snake Subbasin would be the re-establishment of a sustainable white sturgeon harvest while ensuring a sustained population level above the minimum viable population size necessary to maintain adaptability and genetic diversity.

2. Tucannon Subbasin



The Tucannon River Subbasin in southeast Washington covers approximately 500 square miles. The Tucannon River originates at about 6,400 feet on Oregon Butte in the Blue Mountains, and flows about 50 miles to the Snake River. The river and its tributaries derive solely from precipitation and groundwater, with the highest flows in May and the lowest in August.

The subbasin contains cropland, both dry and irrigated, rangeland and forests. The Umatilla National Forest covers a portion of the subbasin. Water is diverted for irrigation in the lower river valley, but the diversions have not been considered to pose significant problems for salmon. A recently modified dam may impede anadromous fish migration. Elevated temperatures and sedimentation pose the biggest limitations for salmon production in the Tucannon subbasin.

The indigenous anadromous fish species most actively targeted for management in the Tucannon River Subbasin are fall chinook, spring chinook, and summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource problems include high temperatures, irrigation diversion, sedimentation, loss of riparian vegetation, and passage problems. Extensive stream channelization has contributed to the increased velocities and flash flooding. Levees have narrowed the floodplain and contributed to channelization. Over the past 50 years, farming, livestock management, recreational activities, and catastrophic flood events have contributed to habitat degradation.

To address these problems, and to attempt to achieve the goals, the co-managers have adopted the following outcome-based objectives: 1. Improve adult pre-spawning survival; 2. Improve juvenile survival; and 3. Utilize supplementation to increase natural production.

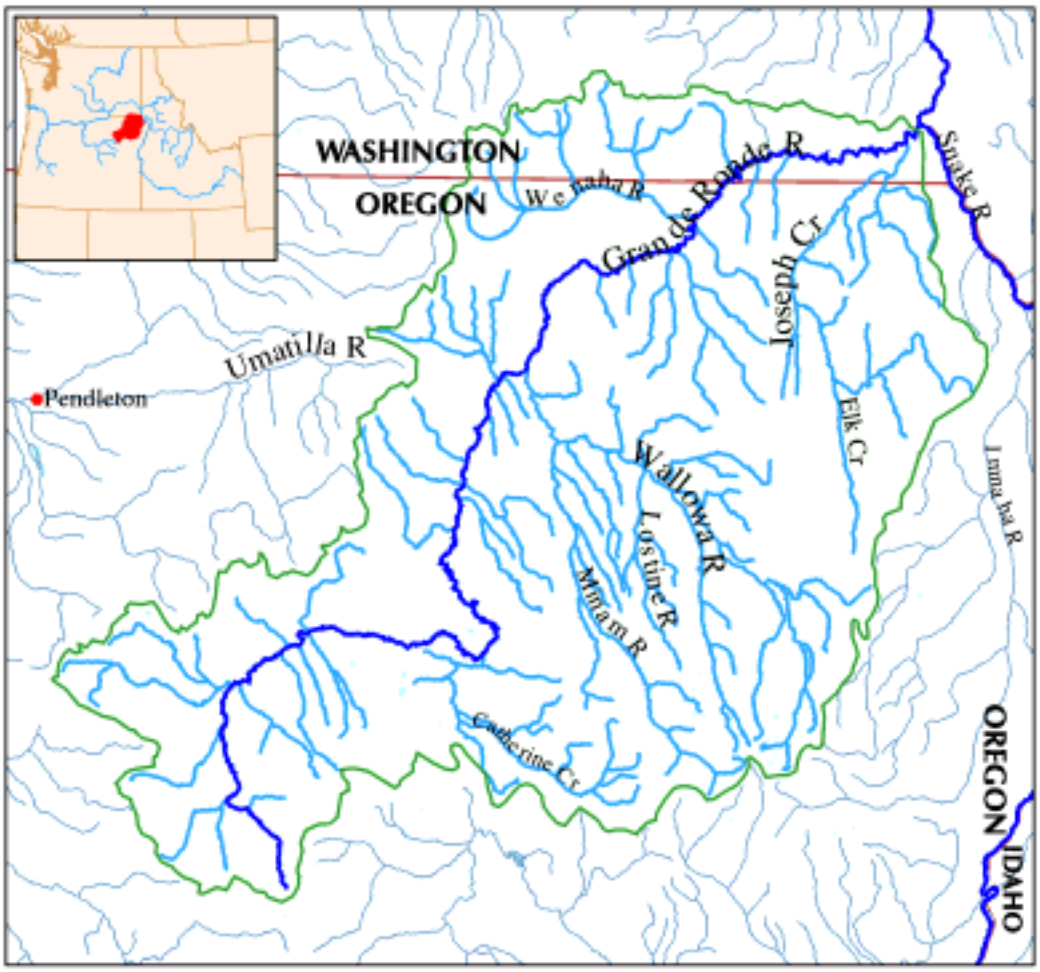
The broad general strategies used to achieve these objectives include improving habitat through the use of instream structures and passage improvements at barriers and increasing adult returns to supplement natural production and provide fish for harvest.

Specific actions critical to carrying out these strategies are funded under projects #9401805, 9401806 and 9401807. These two projects now incorporate the activities that were funded under project #9202602. These projects fund an Eastern Washington Model Watershed Coordinator through the Washington State Conservation Commission to develop model watershed plans for Asotin Creek, Tucannon River, and Pataha Creek and coordinate habitat improvement work on private lands. These projects fund Washington conservation districts to work with landowners to implement the model watershed plans for the Asotin Creek, Tucannon River, and Pataha Creek model watersheds.

Supplemenation activities are being accomplished by releases of fish from Lyons Ferry Hatchery funded by the Lower Snake River Compensation Plan.

The Asotin Creek Model Watershed Plan was completed in April 1995. The Tucannon River Model Watershed Plan and the Pataha Creek Model Watershed Plan were completed in the spring of 1997.

3. Grande Ronde Subbasin



The Grande Ronde Subbasin is located in the northeast corner of Oregon and covers 3,950 square miles. A small portion of the subbasin is in Washington. The Grande Ronde River originates in the Blue Mountains and flows north to the Snake River. The confluence is upstream from eight major Columbia River dams. The Grande Ronde and its tributaries are snowmelt runoff streams, with peak flows in spring.

The Forest Service manages about 45 percent of the land in the subbasin. Both the Wallowa-Whitman and Umatilla National Forests cover parts of the subbasin. Most of the Forest Service land is managed for timber, grazing and recreation. Agriculture is the most important economic enterprise in the subbasin, with thousands of acres of privately owned irrigated cropland. La Grande, Oregon, is the largest town.

The indigenous anadromous fish species most actively targeted for management in the Grande Ronde River Subbasin are fall chinook, spring chinook, coho (extirpated), sockeye (extirpated) and Group A summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource problems include inter-related water quantity and quality problems (e.g., low flows and high temperatures & pollutants) result in poor survival during juvenile rearing and migration, in many areas outside wilderness, particularly the lower Grande Ronde River, Wallowa River, and lower Catherine Creek. Riparian degradation and channelization reduces habitat available for adult holding and juvenile rearing in most reaches outside of wilderness areas. Water quantity, quality, and sediment problems reduce the success of fall chinook spawning. These problems have caused major habitat fragmentation and resulting poor connectivity. Combined with out-of-subbasin problems (e.g., Columbia mainstem passage), these problems have lead to the extirpation of sockeye and coho, and reduced populations of spring and fall chinook, and summer steelhead. This has caused greatly reduced production and loss of harvest opportunities.

To address these problems, the co-managers have adopted the following outcome-based objectives: 1) improve adult and juvenile migration success; 2) improve adult holding and juvenile rearing survival; and, 3) release additional genetically-appropriate salmon in selected areas of the subbasin.

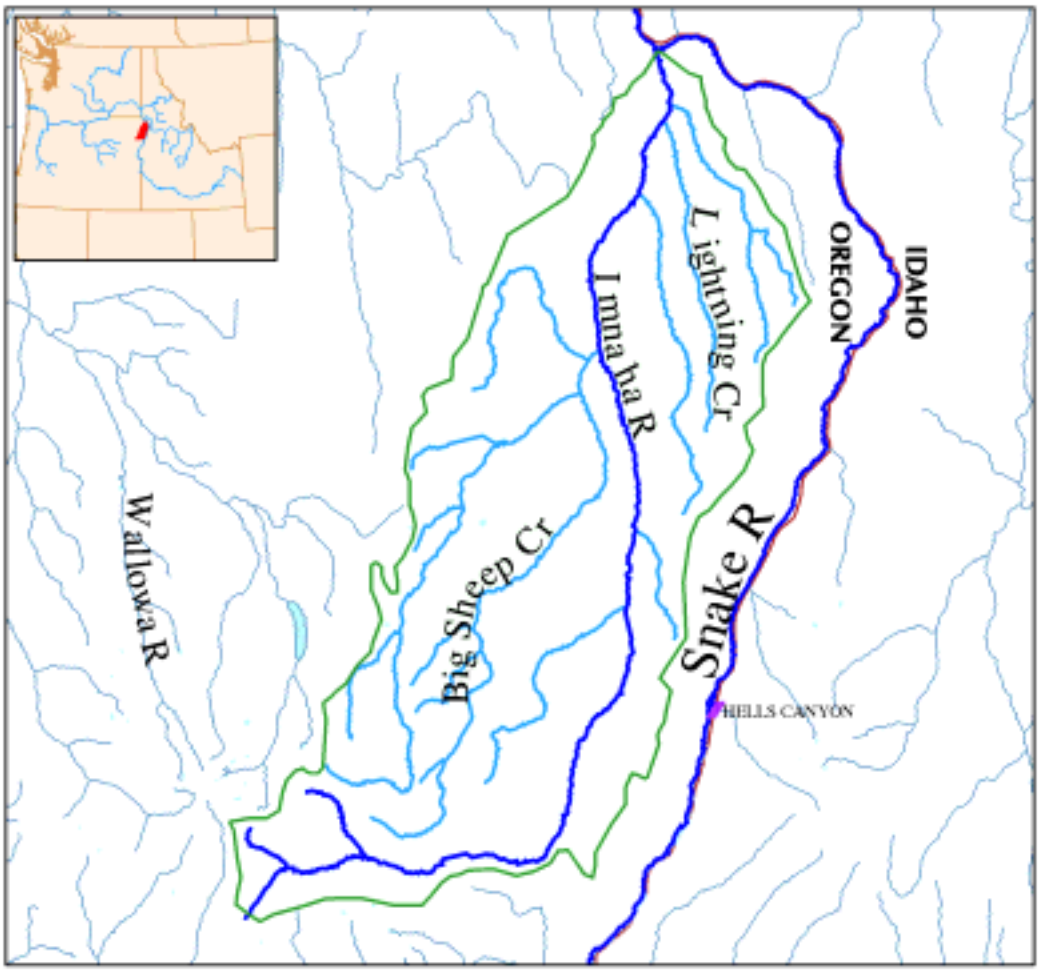
Strategies to achieve these objectives include developing and implementing a comprehensive watershed based restoration program incorporating habitat restoration, hatchery production, research and monitoring and evaluation. Habitat restoration is directed at improving natural production through the use of instream and riparian projects. Hatchery production focuses on restoring wild production through use of both captive and conventional brood stock techniques. Captive brood stock techniques are used to prevent extinction and maintain genetic diversity of wild populations during periods of extremely low escapement. Conventional broodstock techniques are used to bolster populations at low to moderate escapements. Both hatchery techniques emphasize supporting wild production, not replacing with hatchery production. Research and monitoring and evaluation is an important aspect of these strategies. Research focuses on addressing critical questions associated with selecting future management actions. Monitoring and evaluation will address the performance of these actions in meeting the goals of restoring wild populations. Program changes will be made through an adaptive management framework of identifying expectations and monitoring results.

Specific actions (projects) that are funded under BPA to address these strategies have been deemed critical for accomplishing the objectives in an attempt to achieve the goals. These projects include administration, coordination and planning support for habitat enhancement work (projects #9202601 and 9403900), under the auspices of which other contracts have been agreed to for habitat enhancement implementation projects (#8402500, 9402700, 9608300, and 9702500).

Production projects to support and augment natural production include Lookingglass Hatchery and satellite facilities which were built and are operated with LSRCP funds. The co-managers have used funds from #8805301 and #8805305 (Northeast Oregon Hatchery) to plan additional supplementation hatchery facilities (projects #9800702 and #9800703). Captive broodstock protection and supplementation of Grande Ronde stocks is also funded under #9801001 and #9801006. Monitoring and evaluation of supplementation impacts on genetic characteristics is funded under project #8909600.

In the recent past, projects #8344100, 9202604, 9307000, and 9602001 funded research and monitoring of coho and chinook in the Grande Ronde. Project #9607700 funded habitat monitoring, and projects #8339200 and 8400900 funded habitat improvements. ODFW utilized funds under project #9604400 to develop a captive broodstock facility at Bonneville hatchery.

4. Imnaha Subbasin



The Imnaha Subbasin also is located in the northeast corner of Oregon and covers 980 square miles. The Imnaha River originates in the Wallowa Mountains and flows about 63 miles north to the Snake. The subbasin is mountainous, with peaks as high as 10,000 feet. Peak flows in the subbasin occur from April through June. Until recently, the North and South Forks of the Imnaha River were considered to be inaccessible to anadromous fish, but in 1988, researchers found the first documented evidence of spawning.

Almost 75 percent of the subbasin is within the Wallowa Whitman National Forest and most of the remainder is privately owned. The private land is primarily used for grazing, with some fields in hay production. Water resources in the subbasin are generally sufficient to sustain anadromous fish. Imnaha (population 25) is the only town in the subbasin.

The indigenous anadromous fish species most actively targeted for management in the Imnaha River Subbasin are fall chinook, spring/summer chinook, coho (extirpated), and Group A summer steelhead. The goal is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The subbasin has been impacted by moderate levels of logging, road building, mining, farming, and ranching practices. These are not thought to be major limiting factors on fish production. Combined with out-of-subbasin problems (e.g., passage at eight Columbia mainstem dams and harvest), these problems have lead to the extirpation of coho, and reduced populations of spring, summer and fall chinook and summer steelhead. This has caused under-seeded habitat, greatly reduced production and loss of harvest opportunities.

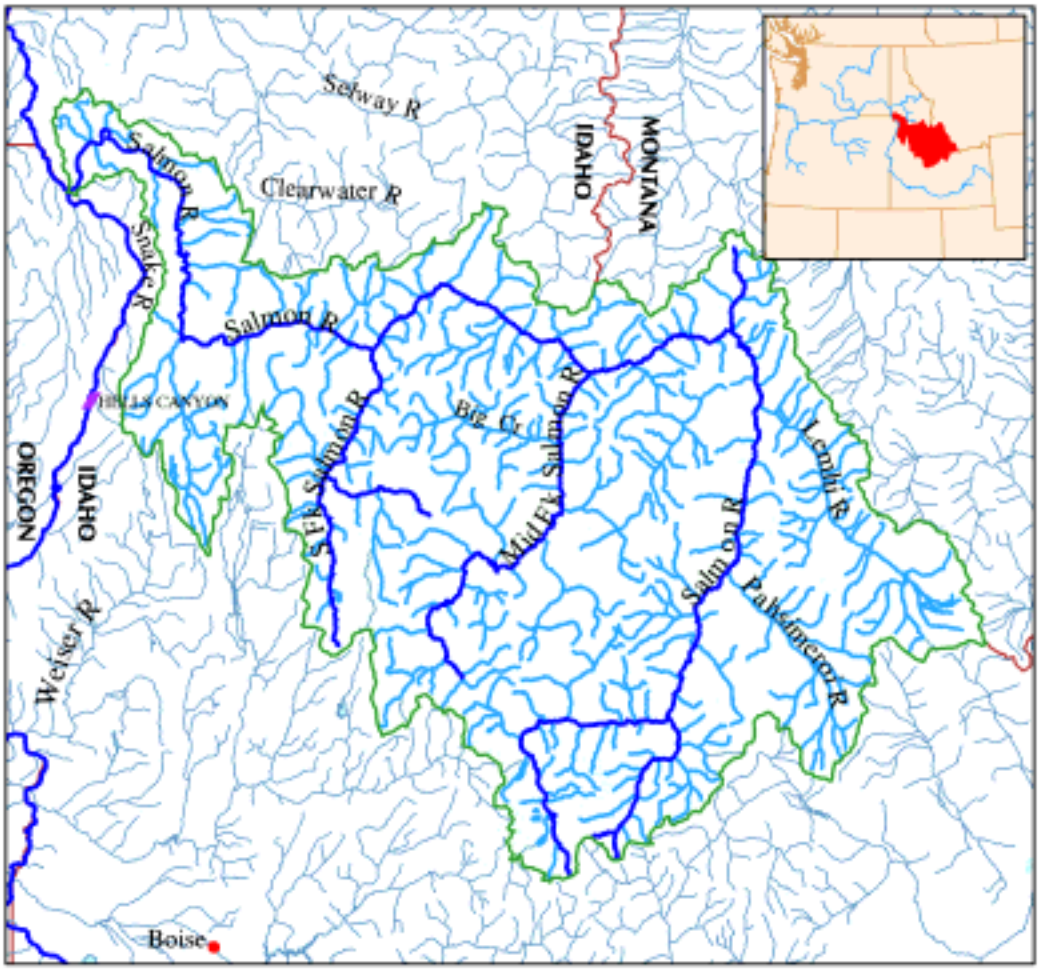
The co-managers have adopted the following outcome-based objectives to address these problems: 1) improve juvenile salmonid survival; 2) reduce pre-spawning mortality of adult salmonids; and, 3) release additional genetically-appropriate salmon in the subbasin. Broad general strategies aimed at achieving these objectives include developing and implementing a comprehensive watershed based restoration program incorporating habitat restoration, artificial propagation, research and monitoring and evaluation. Habitat restoration is directed at improving natural production through the use of instream and riparian projects. Hatchery production focuses on maintaining and restoring wild production through use of conventional production techniques. Research and monitoring and evaluation is an important aspect of these strategies. Program changes will be made through an adaptive management framework of identifying expectations and monitoring results.

Specific actions that implement these strategies include project #9403900 for habitat enhancement coordination and planning and project #9702500 for implementing habitat restoration.

Supplementation actions are implemented with LSRCP funds through the Lookingglass Hatchery and satellite facilities. The co-managers use funds from #8805301 and #8805305 (Northeast Oregon Hatchery) to coordinate and plan future supplementation hatchery actions.

Research and monitoring and evaluation is an important aspect of these strategies, funded under project #8712703.

5. Salmon Subbasin



The Salmon River Subbasin spans across central Idaho, covering more than 14,000 square miles. It is the second largest subbasin in the Columbia River drainage. The largest is the Snake. The Salmon River flows from its headwaters 410 miles to the Snake. Most of the precipitation in the basin falls as snow, with peak streamflows during April and June due to snowmelt. There are no major barriers to anadromous fish, although drainage from mining and irrigation diversions pose limitations on some tributaries.

The U.S. Forest Service is the largest landholder in the subbasin, with almost 80 percent of the area within six national forests. The largest tract of wilderness in the lower 48 states is within the subbasin. Only 8 percent of the area is privately owned, but the

private owners control essential water rights. Major land uses in the subbasin are forestry, recreation, wilderness, agriculture and grazing.

The indigenous anadromous fish species most actively targeted for management in the Salmon River Subbasin are fall chinook, spring/summer chinook, coho (extirpated), sockeye, and Group A and Group B summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource problems include irrigation diversions that have reduced the carrying capacity of some streams by reducing the rearing and spawning area through disconnecting tributary streams from mainstem corridors. De-watered habitat and increased water temperatures, particularly in the upper Salmon (Lemhi, Pashimeroi, and East Fork) and in the Little Salmon have also diminished carrying capacity. Many irrigation diversions present impediments to adult migrants. Also unscreened and inadequately screened diversions are major sources of mortality to juveniles. Overgrazing and channelization has reduced riparian vegetation over much of the headwater rearing areas contributing to increased water temperatures and sedimentation. These problems have caused major habitat fragmentation resulting in poor connectivity. Between freshwater habitat loss and mainstem passage problems in the Snake and Columbia rivers sockeye and coho have been extirpated, and spring and summer chinook and summer steelhead have been significantly diminished. All of this has contributed to under-seeded habitat, reductions in production and loss of harvest opportunities.

In order to address these problems, the co-managers have adopted the following outcome-based objectives: 1) improve adult holding and pre-spawning survival; 2) improve spawning success and survival to emergence; 3) improve juvenile rearing and over-wintering survival; 4) improve summer parr survival; and, 5) supplement where needed with genetically-appropriate salmon and steelhead in the subbasin using stock specific escapement criteria capable of maintaining stock productivity, survival and genetic diversity.

General stategies to achieve these objectives include improving habitat and riparian areas; improving adult and juvenile passage at irrigation diversions; supplementing naturally spawning populations with local broodstock to enhance natural production (includes research & monitoring to evaluate supplementation); using captive broodstock techniques to increase numbers of Redfish Lake sockeye and re-introduce to Sawtooth area lakes; and releasing hatchery produced juveniles to provide harvest opportunities.

Specific actions to carry out these strategies include project #9009 which will restore a healthy riparian corridor along 12 miles of the Salmon River near Challis, Idaho and restoring the natural floodplain. Project #9202603 supports Idaho Model Watershed administration and coordination; and project #9401700 implements habitat restoration in the Lemhi, Pahsimeroi and East Fork drainages. Project #9405000 is a habitat enhancement project on Bear Valley Creek, the Yankee Fork and East Fork of the

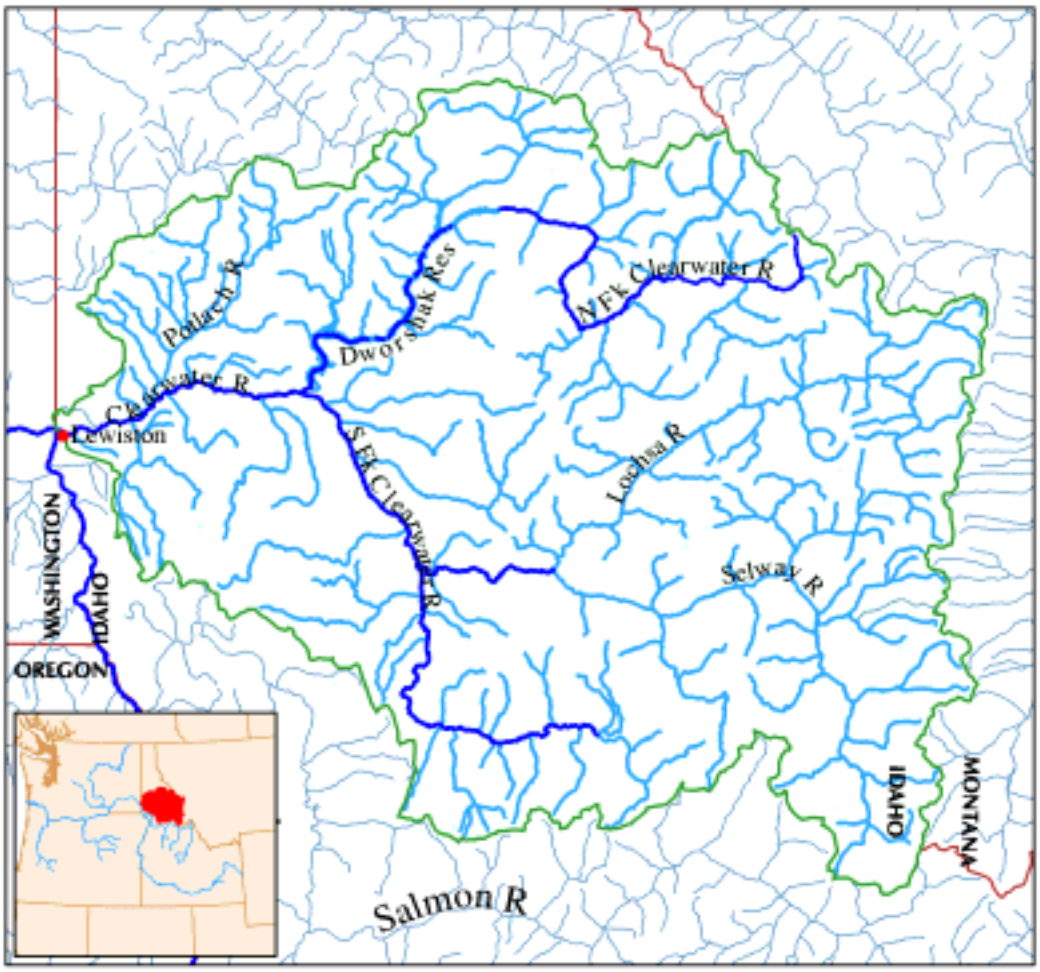
Salmon River that includes implementing habitat restoration and conducts O&M and M&E of major past investments. Project #9202408 would fund tribal law enforcement activities to protect the fishery resource from and man-caused habitat degradation.

Project #9401500 is responsible for the construction and maintenance of screens, consolidation of diversions and replacement of diversions with pumps, construction of fish ladders, and conducting pump and diversion surveys. Project #9600700 is in the process of eliminating three diversions in the Salmon River through consolidations and installing a pump on the Salmon River to replace Lemhi River water during times of critical fish passage needs on the Lemhi River. Projects #9306200 and # 9401700 are habitat enhancement projects on the Lemhi, Pashimeroi and East Fork of the Salmon River designed to increase flow, reduce physical barriers to migration and restore riparian vegetation.

Project #9604300 is a small-scale supplementation project designed to increase survival of a weak but recoverable stock of summer chinook on Johnson Creek on the South Fork of the Salmon River. Project #9705700 is a supplementation project for chinook and steelhead that includes side stream incubation, and captive broodstock/rearing in conjunction with projects #9700100 and #9606700. Captive rearing monitoring is included in project ##9801002. Project #9703800 preserves chinook salmon gametes by cryo-preservation to maintain genetic diversity in a small population. Project #9703000 uses passive underwater video to compare adult chinook returns to supplemented and unsupplemented streams to evaluate supplementation. Projects #8909800, #8909801, #8909802, #8909803, and #9005500 are designed to evaluate the usefulness of supplementation as a recovery/restoration measure for depressed stocks of spring and summer chinook and summer steelhead in the Salmon and Clearwater subbasin streams. Project #9107300 funds continuing monitoring of natural production throughout the Salmon and Clearwater subbasins. Project #9064 will attempt to describe factors influencing the spatial distribution and persistence of wild chinook salmon based on the emerging conservation theory that suggests that recolonization and persistence of widely ranging species may be strongly influenced by the spatial geometry of remaining habitats.

Project #9107100 is funded to determine the sockeye carrying capacity for nursery lakes in the Salmon River basin and to improve the lake habitat. Projects #9107200 and #9204000 are captive rearing projects to aid in recovery of Stanley Basin sockeye. Lower Snake Compensation Plan and Idaho Power Company mitigation has been funding efforts to release hatchery produced juveniles to provide hatchery broodstock, supplementation of natural production, and to provide harvest opportunities.

6. Clearwater Subbasin



The Clearwater River Subbasin is located in north-central Idaho and covers 9,645 square miles. The Clearwater River originates at about 9,000 feet elevation in the Bitterroot Mountains. The Clearwater flows into the Snake River. About one-third of the Snake River streamflow comes from the Clearwater, which has several major tributaries. Dams have limited salmon production in the subbasin. Dworshak Dam blocks anadromous fish migration into all but about two square miles of the North Fork of the Clearwater River.

About 85 percent of the Clearwater subbasin is conifer forest, and the remainder is rolling high prairie. The subbasin includes the 1,250 square-mile Nez Perce Indian Reservation, of which 133 square miles are tribal or trust lands administered by the Bureau of Indian Affairs. The federal government owns 61 percent of the land in the subbasin and private landowners account for 32 percent. The U.S. Forest Service manages most of the federal land. Forestry, agriculture, and grazing are the major land uses in the subbasin.

The indigenous anadromous fish species most actively targeted for management in the Clearwater River Subbasin are fall chinook, spring and summer chinook, coho (extirpated) and Group A and Group B summer steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

Resource problems include sedimentation and lack of large woody debris, locally in the Lochsa, South Fork and Mainstem tributaries, which has decreased number and size of pools, potentially reducing adult pre-spawning survival; cobble embeddedness has reduced spawning success and survival to emergence; lack of pools has also reduced juvenile rearing and over-wintering success; and, high water temperatures have reduced juvenile survival, particularly in the Middle Fork Clearwater and tributaries to the South Fork, Lochsa, and Mainstem. These problems have caused reductions in the quality and quantity of habitat including fragmentation that has resulted in poor connectivity. A previously existing dam near the mouth of the Clearwater at Lewiston lead to the extirpation of spring and summer chinook from the drainage. Out-of-subbasin mortality in the form of Columbia and Snake river mainstem dams plus tributary habitat degradation has lead to the extirpation of coho, reduced populations of fall chinook and summer steelhead and diminished the opportunity to re-establish spring chinook. This has resulted in under-seeded habitat, loss of production potential and lost harvest opportunity.

The co-managers have adopted the following outcome-based objectives in order to address these problems: 1) improve adult holding and pre-spawning survival; 2) improve spawning success and survival to emergence; 3) improve juvenile rearing and over-wintering survival; 4) improve summer parr survival; and, 5) supplement where needed with genetically-appropriate salmon and steelhead in the subbasin using stock specific escapement criteria capable of maintaining stock productivity, survival and genetic diversity.

The general strategies to address these objectives include developing and enforcing stock-specific escapement criteria to maintain productivity, survival, and genetic diversity; supplementing natural production, consistent with wild production goals; improving stream habitat; and conducting research, monitoring and evaluation.

Specific actions to carry out these strategies include USFWS management of the Dworshak spring chinook program under the LSRCP. Clearwater Anadromous is operated by IDFG. The Dworshak Complex Manager (USFWS) runs the Kooskia artificial production facility. All three facilities are operated to augment the run for harvest opportunity of spring chinook and Group B steelhead. These facilities are also operated to support natural production for the Idaho Supplementation Studies (projects #8909800, #9005500, #8909801). Some natural production does occur when returning adults are released above collection weirs. The LSRCP program is operated primarily to mitigate for lost harvest as a result of the four lower Snake River dams. The Nez Perce

Tribal hatchery has been planned to produce spring and fall chinook to restore and enhance naturally-spawning populations in the Clearwater drainage. This project (#8335000) includes central incubation/rearing facilities, six satellite facilities for adult collection/holding and juvenile acclimation/release sites. A rearing facility is currently operating at Sweetwater Springs, a tributary to Lapwai Creek.

The Idaho County SCD is doing a restoration project (#9303501) on lower Red River meadow that is part of an experiment to restore the riparian habitat and meadow complex to hydraulic equilibrium. The Clearwater is a NPPC-designated "focus" watershed; that includes habitat enhancement planning, administration, and some project implementation funded under #9608600 and #9706000. Habitat enhancement and restoration activities are funded under projects #9607702 (Lolo Creek), #9607703 (Squaw and Papoose creeks), #9607704 (Lower Eldorado Falls), and #9607705 (McComas Meadows). New habitat restoration work that is proposed for initial funding in FY 1999 includes #9059 (Little Canyon Creek), #9060 (Nichols Canyon), #9120 (Big Canyon Creek) and #9122 (Lapwai Creek). Project #9202409 would fund tribal law enforcement activities to protect the fishery resource from poaching and man-caused habitat degradation.

The Nez Perce Tribe conducts artificial production M & E under project #8335000. Additional research, monitoring and evaluation of supplementation is being conducted under the Idaho Supplementation Studies #8909800, #9005500, #8909801, #8909802, and #9403400. New research and evaluation projects recommended for FY 1999 funding include #9011 (residual steelhead) and #9057 (Pacific lamprey).

Past work has included conducting long-term monitoring on anadromous populations within the Clearwater since the early 1980s (#9107300). The Nez Perce Tribe has completed stream inventories and habitat surveys in the lower Clearwater area under projects #8200100 and #8801500. USFS implemented instream habitat improvement projects funded by BPA in the Lolo/Crooked Fork/Eldorado Creek (#8400600), Red River (#8350100) and Crooked River (#8350200 and #8400500) areas. The USFS studied opening habitat above Orofino Falls under project #8711200.

The primary native resident fish species targeted for active management in the Clearwater Subbasin include bull trout, westslope cutthroat trout, mountain whitefish, and redside shiner. Target non-native fish include kokanee, rainbow trout and smallmouth bass. These target species directly support fisheries, except the redside shiner, which is an important forage species. Restoration of the redside shiner population in Dworshak Reservoir would benefit trout and smallmouth bass fisheries. Five regional goals were captured in the Resident Fish Multi-year Implementation Plan (RFMYIP) appendix to the June 4, 1997, Resident Fish Annual Implementation Work Plan (CBFWA 1997). The intent of these goals is two-fold: 1) to conserve, protect and enhance production and distribution of these species throughout their historical range; and, 2) to provide sustainable fisheries, including harvest opportunities.

Within the Clearwater Subbasin, fisheries managers intend to achieve these goals by effecting a series of management objectives that address population characteristics,

distribution range, and fisheries characteristics. These objectives, also described in the RFMYIP, include: 1) maintaining and restoring population productivity reduced by hydropower development and operations to healthy levels which provide for consumptive and nonconsumptive uses of native population; and 2) ensuring sustained population levels of native fish above the minimum viable population sizes which maintain adaptability and genetic diversity.

These strategies include the following: 1) re-establishing flow regimes that mimic the natural hydrograph, stock assessments, restoring anadromous fish populations to support ecosystem components necessary for healthy native resident populations (nutrients, food resources, habitat); 2) develop localized broodstock of westslope cutthroat trout for mitigation stocking to replace non-native rainbow trout stocking; 3) control or eliminate kokanee entrainment through Dworshak Dam; 4) managing Dworshak Reservoir pool levels for fish and fish food production; 5) fishery regulation and habitat enforcement; and, 6) developing additional pond fisheries compatible with native fish management.

The Nez Perce Tribe and the Idaho Department of Fish and Game completed a Bonneville Power Administration (BPA) funded fishery assessment of Dworshak Reservoir in 1993 (Maiolie, Statler and Elam 1993). The Tri-agency System Operation Review of the Federal Columbia River Power System (FCRPS) applied information obtained from this work to evaluate numerous alternative operations. Ongoing work at the Dworshak Project is directed at strategies to reduce or eliminate kokanee entrainment (Project #8709900) and to develop and refine biological/integrated rule curves (Project #8740700). This work is directly applicable to evaluating the use of Dworshak Reservoir to augment flows for listed Snake River salmon and steelhead. Information obtained is applied to in-season flow management on a real-time basis pursuant to the National Marine Fisheries Service=s Biological Opinion for Operation of the FCRPS. With the exception of winter/spring spill periods, study data have been applied to reduce kokanee entrainment via variable outlet selector gate adjustments. Project # 9501600 is investigating the extent of genetic introgression of native westslope cutthroat trout populations as a result of stocking non-native rainbow trout. The intent is to have stocking strategies to augment fisheries for mitigation that are compatible with or beneficial to westslope cutthroat trout within the North Fork Clearwater drainage. Two trout ponds have been rehabilitated to restore productive capacity to substitute, in part, for the loss of anadromous fish posed by the permanent blockage at Dworshak Dam (Project #9501300). Two additional pond sites are under investigation.

As a result of controlling or eliminated entrainment of kokanee at Dworshak Dam, expected outcomes include an improved and stabilized kokanee fishery at Dworshak Reservoir, an improved or stabilized forage base for bull trout, and an expanded potential for a large predator fishery. Application of an integrated operational rule curve at Dworshak Reservoir is expected to benefit fish forage, including benthic invertebrates, terrestrial insect deposition, zooplankton, and possibly redside shiners. Restoration of a more normative hydrographic regime through Dworshak Dam would expect to benefit resident fish in Dworshak Reservoir and anadromous fish below Dworshak Dam. Replacing the non-native rainbow trout mitigation program at Dworshak Reservoir with

one using progeny from a localized broodstock of westslope cutthroat trout would be expected to protect and enhance current naturally reproducing populations of westslope cutthroat trout within the North Fork Clearwater drainage. Restoration and expansion of trout pond habitat would be expected to provide a harvest of 8,750-10,500 pounds of trout annually in a manner consistent with the management of sensitive native species.

H. Upper Snake Subregion

The Upper Snake Subregion is defined as the Snake River and its tributaries from the Hells Canyon Dam to the headwaters. This subregion covers approximately 72,300 square miles and includes the following subbasins: Upper Snake Mainstem, Palouse, Weiser, Payette, Malheur, Boise, Owyhee, and the Closed Snake.

The overall goal of the Upper Snake Subregion is to mitigate and compensate for resident and anadromous fish losses caused by the construction and operation of federally-regulated and federally-operated hydropower projects. The primary native resident fish species that are targeted for active management in this region include bull trout, redband trout, cutthroat trout and white sturgeon. The management intent of these populations by the area fish managers can be expressed by two main goals. The first and primary goal of this subregion is to protect, enhance and restore, where needed, these fish in their historical habitat. The second goal is to provide fisheries and harvest opportunities of native fisheries and also of introduced game fish where native fisheries have been irrevocably altered. Both of these goals have been further defined by a specific set of management objectives that describe desired population levels, water quality levels, and

habitat standards. These objectives are outlined in the Multi-Year Implementation Plan in a Basin wide description of fish management plans developed by regional fish managers in the Columbia Basin.

To achieve management objectives in the Upper Snake for the fish species of interest, fish managers have outlined several broad strategies. From a population perspective, the strategic intent is to protect, maintain and enhance native fish production, identify populations with unique genetic characteristics and maintain this diversity, and re-establish populations, where possible, in areas where native populations have been eliminated. From a management perspective, the strategic intent focuses on learning more about the condition of existing fish populations and the habitat in which they live, protecting and enhancing this habitat, and creating harvest opportunities and managing angling demand consistent with healthy fish populations.

Specific actions can be defined for each of these strategies. Fish production is maintained and enhanced by managing habitat and harvest and in some cases, using artificial production to supplement populations. Genetic diversity and adaptiveness of fish populations is maintained by establishing protection refuges for wild populations in the absence of hatchery fish. Populations are re-established within historic ranges by connecting habitats, and re-establishing historical habitat conditions. Learning is accomplished by assessing fish population status, fish distribution and habitat conditions, and monitoring responses of each to management actions. Habitat is protected and enhanced by providing necessary stream flows, improving water quality and halting and reversing habitat degradation. Using artificial production and improving natural production creates harvest opportunities. Angling demand is managed by promoting angling opportunities, controlling angler access and managing introduced gamefish such as bass, crappie, catfish and hatchery trout; however, these actions are of lower priority to fish managers than maintaining and enhancing native populations.

BPA funded projects in this area include several habitat and fish survey studies that assess habitat conditions and fish populations, radio implanting and pit tagging throughout the subregion, as well as one hatchery stocking project in two small off channel reservoirs where native species never existed. These projects are administered by local tribal entities such as the Shoshone-Paiutes, Shoshone-Bannocks and the Burns Paiute Tribe, and local agencies such as Idaho Fish and Game and the Oregon Department of Fish and Wildlife. These tribes work closely with local agencies, often in cost-share arrangements, to manage the fisheries in this subregion.

The specific wildlife mitigation goal for the Upper Snake Subregion is to fully mitigate for the wildlife losses caused by the construction and operation of the hydroelectric projects located in the subregion. These hydro projects are listed below, with the estimated losses due to hydropower construction and habitat mitigation priorities as listed in the NPPC's Fish and Wildlife Program.

Upper Snake Subregion HU Losses by Hydro Project	
Hydro Project	**HU loss**
Anderson Ranch	9,619
Minidoka	10,503
Palisades	37,068
Black Canyon	2,238
Deadwood	7,413
Total	**66,841**

Upper Snake River Subregion Wildlife Mitigation Priorities	
Habitat Type	**Priority**
Riparian/Riverine	High
Wetlands	High
Native Grasslands and Shrubs	Medium
Coniferous Forest	Medium
Old Growth Forest	Medium
Lowland Forest	Low

The wildlife mitigation objectives in the Upper Snake Subregion are consistent with the overall objectives outlined in the introduction to Section IV of this workplan.

The wildlife mitigation strategies in the Upper Snake Subregion are to:

1. Continue regional coordination of projects in southern Idaho under the Southern Idaho Wildlife Mitigation Project.

Past Accomplishments

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9505700	Southern Idaho Wildlife Mitigation	IDFG	Upper Snake	Palisades	8,094

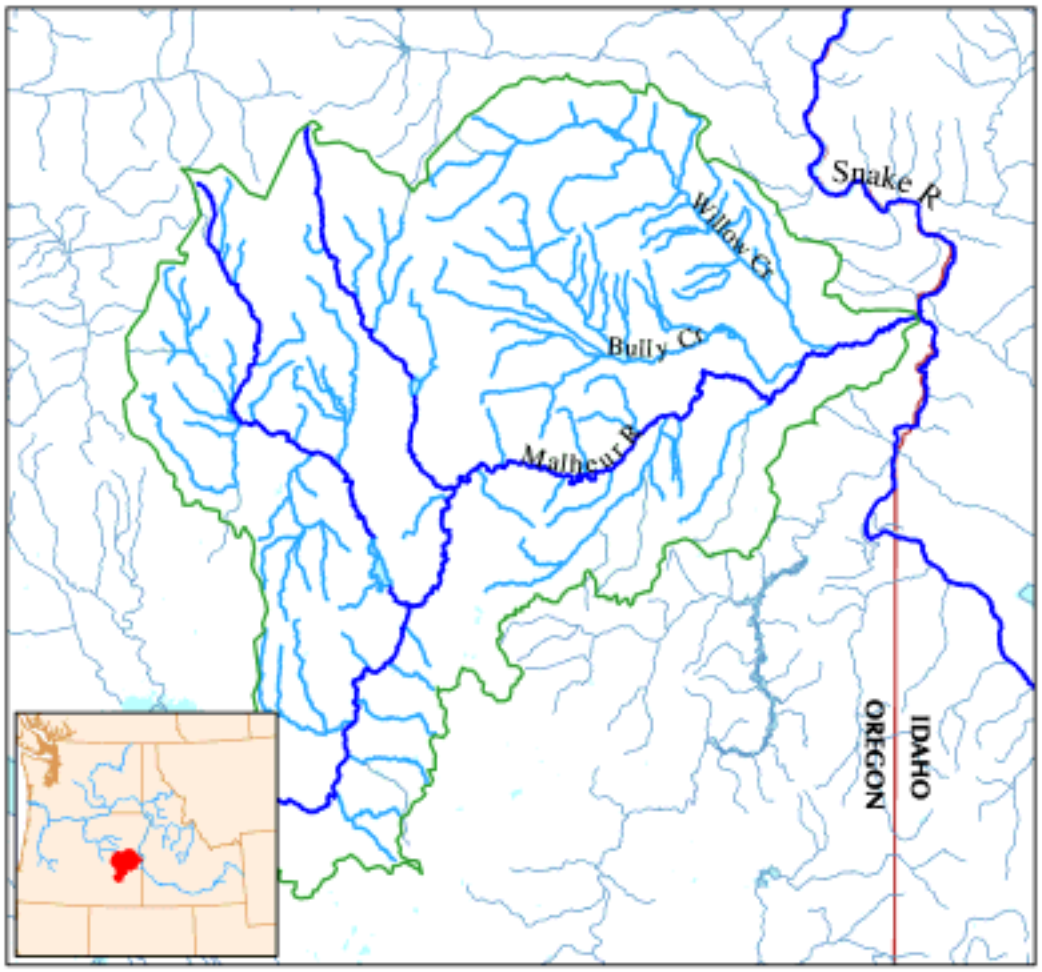
Expected Outcomes

It is expected that estimated losses due to hydropower construction will be fully mitigated for by the activities of ongoing projects and projects implemented in the future. The following projects have been proposed for FY 1999:

Project	Title	Sponsor	Subbasin	Hydroproject	Estimated HU Gains
9106	OWC - Acquisition of Malheur Wildlife Mitigation Site	BPT	Malheur	Oregon hydroproject TBD	1,500 to 2000 on deeded property
9505700	Southern Idaho Wildlife Mitigation	IDFG	Upper Snake	Palisades, Anderson Ranch, Black Canyon	10,495

Refer to project descriptions for more information on these projects.

1. Malheur Subbasin



The Malheur River is located in Eastern Oregon and flows into the Upper Snake River on the border of Idaho and Oregon.

The primary goal of this subbasin is to protect, enhance and restore where needed, resident and anadromous fish in their historical habitat. The second goal of this subbbasin is to provide fisheries and harvest opportunities of native fisheries and also of introduced game fish where native fisheries have been irrevocably altered. Construction of federally-regulated and federally-operated hydropower projects has resulted in the total absence of anadromous fish in this subbasin and has brought about significant damage to native resident fish. Thus, the primary fish species that are targeted active management in this region are bull and redband trout. The goals of this subbasin have been further defined by a specific set of management objectives that describe desired population levels, water quality levels and habitat standards. These objectives

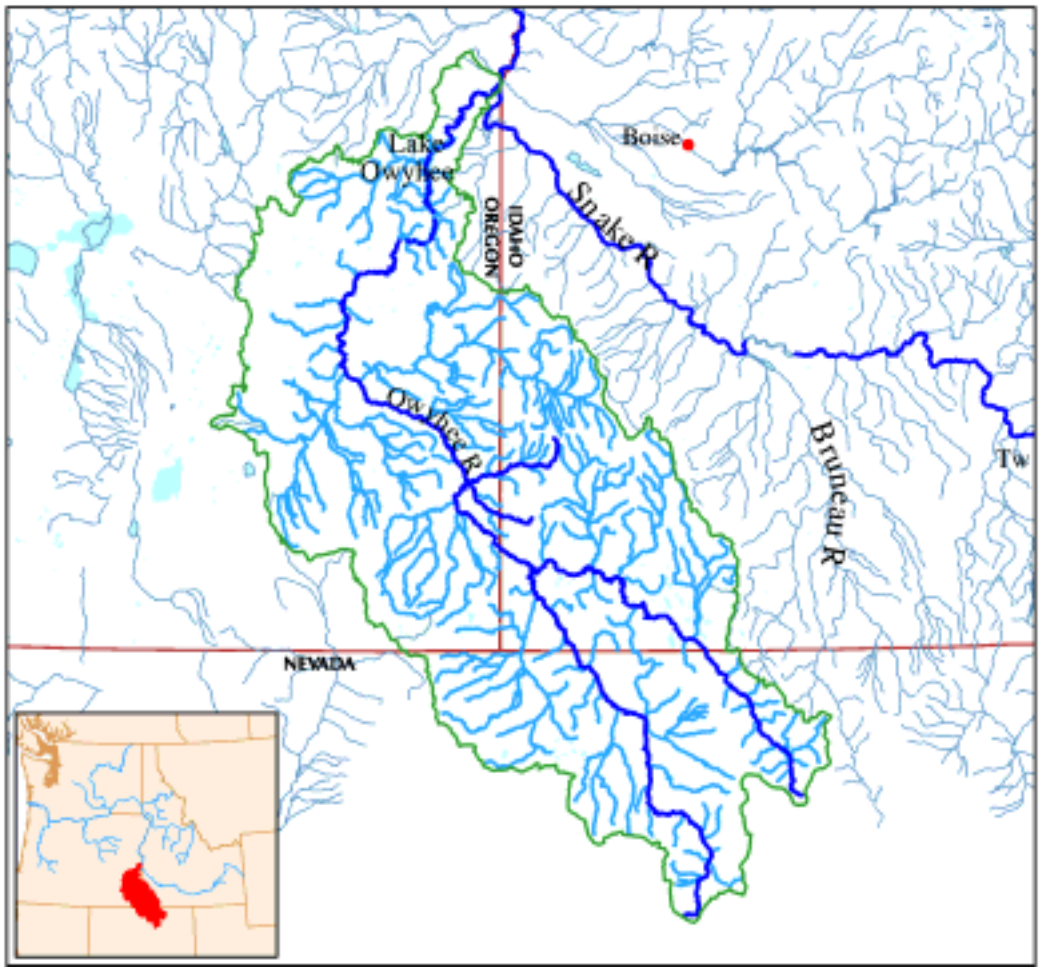
are outlined in the Multi-Year Implementation Plan developed by regional fish managers in the Columbia Basin, the Malheur River Basin Fish Management Plan developed by the Oregon Department of Fish and Wildlife and the Malheur Wild and Scenic River Management Plan developed by the US Forest Service.

In the Malheur Subbasin, area managers have outlined several broad strategies to achieve these goals. From a population perspective, the strategic intent is to protect, maintain and enhance native fish production, identify populations with unique genetic characteristics and maintain this diversity, and re-establish populations, where possible, in areas where native populations have been eliminated. From a management perspective, the strategic intent focuses on learning more about the condition of existing fish populations and the habitat in which they live, protecting and enhancing this habitat, and creating harvest opportunities and managing angling demand consistent with healthy fish populations.

Local fish managers from various agencies are currently implementing specific actions for this subbasin in an attempt to achieve the management goals. These actions include managing habitat and harvest, inventorying genetic diversity of current fish populations, assessing these populations and their distribution and monitoring the responses of these actions. Using artificial production and improving natural production creates harvest opportunities, however stocking programs will be curtailed if there is evidence that indicates that it adversely affects native populations.

Currently, there is only one BPA funded project, the Stinkingwater Salmonid Project, sponsored by the Burns Paiute Tribe in this subbasin. The North Fork Malheur Bull Trout and Redband Trout Life History project, also sponsored by the Burns Paiute Tribe is currently on the funding list for FY 1999. Both of these projects attempt to achieve the management goals in this subbasin assess habitat conditions and fish populations, using screw traps and radio implanting. The Burns Paiute Tribe is working closely with the Oregon Department of Fish and Wildlife, US Forest Service, Bureau of Land Management and the Bureau of Reclamation and has cost-share agreements with these agencies as well.

2. Owyhee Subbasin



The primary resident fish species targeted for management activities in the Owyhee subbasin are the native bull trout and redband trout. Along with these fish species it is also the goal to protect and enhance the streams and rivers in the Owyhee subbasin. There are many free flowing streams that are in near pristine condition. These streams provide excellent habitat for native fish in the subbasin including redband trout and bull trout. Bull trout were known to inhabit this area and have been observed in early sampling in 1997. The Owyhee subbasin has two different strategies to manage the natural resources. The first strategy is based on the following hypothesis: opportunities exist for management of hatchery reared gamefish which optimize consumptive and nonconsumptive use and do not affect native species. The success of this hypothesis is measured through angler surveys, CPUE, and size specific harvest of hatchery fish in the reservoirs. (1998 Annual Implementation Workplan CBFWA)

The second general strategy, which focuses on native species, is based on the following five hypotheses is: 1) operation of the FCRPS has significantly reduced the distribution, abundance,

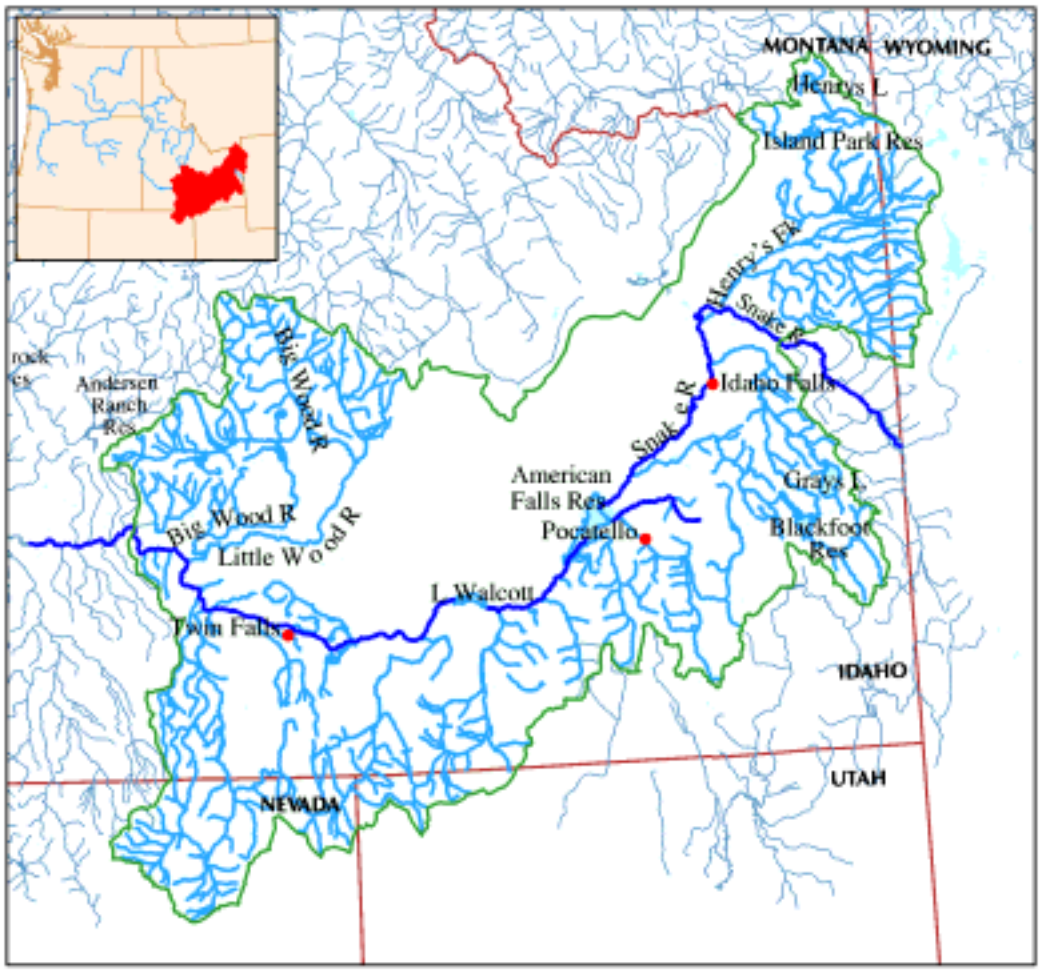
and population viability of native populations in subbasin tributaries; 2) native populations in subbasin tributaries can be protected and restored by habitat improvement measures; 3) effective and efficient implementation of habitat restoration measures for native fish populations in subbasin tributaries can be predicted from assessments of population distributions and status; 4) enforcement emphasis and public information will increase protection for native fish species; and, 5) extinction is preventable.

The success of this strategy is measured by: 1) detailed habitat protection and restoration plans for native fish species; 2) implementation of restoration plans; 3) valid estimates of native fish losses due to hydro power development; and, 4) identification of native stocks and their status (distribution, abundance, size composition, genetic characteristics, and habitat associations).

The projects related to the first strategy began in 1988 with the stocking of fish in two reservoirs on the Duck Valley Indian Reservation (Project #8815600). These fish are stocked annually for the consumptive use of Tribal members as well as for sport fishing. Also, two projects are in the planning stages. Construction of a fishery in Billy Shaw Reservoir on the Duck Valley Indian Reservation should begin in the spring of 1998 (Project #9501500). The second project (Project #9500600) is a joint culture facility with the Shoshone-Bannock Tribes is currently in the Council's three-step process for production facilities. This project will supply fish for the Shoshone-Paiute Tribes two existing reservoir projects as well as for the new Billy Shaw Reservoir.

The second set of strategies relates to the Habitat Enhancement Project for the Shoshone-Paiute Tribes (Project #9701100). This project began in 1997 and a preliminary assessment of the habitat on the Duck Valley Reservation has been completed and is currently being analyzed to determine what protective measures need to be addressed. The Owyhee River and its tributaries are the focus of this project. The major problem encountered thus far is the trampling of critical riparian areas and natural springs from domestic stock. Also, a population survey will be initiated in 1998 as well as preparing genetic samples to determine stocks of native fish on the Duck Valley Reservation.

3. Upper Snake Subbasin



The Upper Snake River Subbasin is located above Hells Canyon Dam in Idaho, and is an area that is no longer accessible to anadromous fish. The subregion covers a large geographic area, extending from southeastern Oregon across southern Idaho and into western Wyoming. A small portion of the subbasin is in northern Nevada and Utah. The Boise and Payette rivers form major subbasins in the western part of the Upper Snake Subbasin. The Boise River drains about 4,130 square miles; the Payette drains 3,270 square miles. The Hells Canyon complex of dams blocks anadromous fish migration into the Upper Snake River Subbasin.

Snake River subbasins above Hells Canyon complex have been directly impacted by many dams, including; Palisades, Anderson Ranch, Black Canyon, and Minidoka. Seasonally predictable hydrographs have been replaced by flow regimes keyed to rapid flooding and drafting of reservoirs in the basin. Stream temperature, physical, and chemical attributes of the mainstem

Snake have been altered since construction of these dams. Indigenous populations of Yellowstone cutthroat trout, whitefish, and bull trout have all been negatively impacted by reservoir operations, either directly through barriers to passage, or indirectly through changes in the biotic and abiotic environment of stream ecosystems in the basin. Native stocks of resident salmonids, especially Yellowstone cutthroat have also been reduced throughout their range through genetic introgression with nonnative fishes and exploitation. In addition, habitat for terrestrial wildlife has been lost due to construction and operation of the aforementioned reservoirs.

The primary goal in this subbasin is to mitigate for resident fish and wildlife losses caused by the construction and operation of Palisades, Anderson Ranch, Black Canyon, and Minidoka dams.

Management objectives for the basin include; adjustment of flows to benefit fish and wildlife in the basin (i.e., restored spawning areas and increased mainstem and tributary passage), restoration of stream and riparian habitats to provide conditions for self sustaining populations of native species assemblages, and re-introduction of native species to restored habitats.

Specific actions which will achieve these objectives include: 1) identify and correct fish passage problems; 2) identify historic and current stocks, population levels, and habitat conditions; 3) assess watershed health; 4) restore habitat; 5) identify genetic purity of native fishes; 6) supplement and reintroduce native species using artificial production; 7) develop put and take fisheries in enclosed terminal waterbodies to provide recreational and subsistence fishery opportunities and ease pressure on native fish stocks; 8) monitor and evaluate reintroduction and supplementation programs; 9) monitor and evaluate natural reproduction and recruitment; and, 10) protect terrestrial habitats on private land through acquisition and easements and enhance wildlife habitats on public land.

VI. Funding Participation by Fish and Wildlife Managers in Regional Forums

Introduction

In recent years, the federal government and the Northwest Power Planning Council (Council) have launched several initiatives to ensure the recovery of fish and wildlife species listed under the Endangered Species Act and improve implementation of the Fish and Wildlife Program under the Northwest Power Act. In support of these initiatives and pursuant to the Acts, several forums have been established to involve Columbia Basin fish and wildlife managers in setting goals and objectives and mapping out strategies for achieving them. In the context of the goals, objectives and strategies developed in these forums, the fish and wildlife managers are asked to recommend specific actions necessary to protect and recover Columbia Basin fish and wildlife species.

It is widely recognized that the proliferation of process has placed a significant burden on the human resources traditionally dedicated to managing fish and wildlife in the Columbia Basin. Fish and wildlife managers play an important role in deciding how the Federal Columbia River Power System (FCRPS) is operated and configured. They also help decide how ratepayers' and taxpayers' dollars are to be spent to protect and restore fish and wildlife in the Columbia Basin. These decisions require significant investments of time by the fish and wildlife managers above and beyond what was traditionally needed.

This document describes several products that the fish and wildlife managers jointly develop to ensure the recovery of fish and wildlife species listed under the Endangered Species Act and implement the Fish and Wildlife Program under the Northwest Power Act. These products are the result of the collective efforts of all the fish and wildlife managers in the Columbia Basin. These products are distinguished from outcomes of other multi-entity efforts (e.g., subregional program or project coordination) by the fact that they can only be developed with the full participation of all the fish and wildlife managers in the Columbia Basin.

The need for these products is a direct result of the development of the FCRPS and its effects on fish and wildlife in the basin. As such, funding of agency and tribal activities necessary to develop these products should be provided under the Fish and Wildlife Program.

Scope of Work

The increased demand on fish and wildlife managers for quality time focuses on several key activities that were not traditionally required to manage fish and wildlife in the Columbia Basin. These activities involve all the fish and wildlife managers in the Columbia Basin and result in the following outcomes:

1) An Annual Implementation Work Plan for the Fish and Wildlife Program.
As described in the Northwest Power Act, the fish and wildlife managers work with the Council and the Bonneville Power Administration (BPA) to identify programs and

projects necessary to implement the Fish and Wildlife Program. Activities include soliciting proposals for projects, evaluating the technical and management merit of proposals received, and selecting a subset of the proposals to be funded under the existing budget. For federal fiscal year (FY) 1999, over four hundred proposals are being evaluated.

2) A Biological Opinion on Operations of the FCRPS.
As described in the Endangered Species Act, the fish and wildlife managers work with the National Marine Fisheries Service (NMFS) to identify and evaluate reasonable and prudent alternatives for operating the FCRPS that pose no jeopardy to listed salmon and steelhead, and other important species, in the Columbia Basin. Activities include identifying alternatives for operating and configuring the FCRPS, evaluating the likely effects each scenario has on the survival and recovery of listed salmon and steelhead, and on other important species, and providing decision alternatives to regional policy-makers for their considerations. This process is commonly referred to as "making the 1999 decision."

3) Recovery Plans for Listed Sturgeon, Salmon, and Steelhead.
As described in the Endangered Species Act, the fish and wildlife managers are working with the US Fish and Wildlife Service and NMFS to develop and implement recovery plans for listed sturgeon, salmon and steelhead. Activities include identifying and taking actions necessary to ensure the survival and recovery of listed species.

4) A Comprehensive Plan for the Protection and Restoration of Fish and Wildlife in the Columbia Basin.
It is widely recognized that fish and wildlife management would benefit from the integration of the many individual plans into a single regional plan. The fish and wildlife managers are developing a Multi-Year Implementation Plan (MYIP) that includes the goals, objectives, and strategies in the Fish and Wildlife Program, recovery plans for listed species, and management plans of the tribes and states. This MYIP should eventually include management plans of the federal land management agencies (US Forest Service and US Bureau of Land Management) and mitigation plans of the federal action agencies (US Army Corps of Engineers and US Bureau of Reclamation).

5) A Regional Plan for Research. Monitoring and Evaluation.
The fish and wildlife managers are working with the Council and others on a number of activities related to addressing critical unknowns and assessing the success of ongoing efforts to protect and restore fish and wildlife in the Columbia Basin. These activities include sponsoring and participating in regional reviews of projects funded by BPA and others and participating in comprehensive program reviews such as the Comprehensive Artificial Production Review. As part of the MYIP, the fish and wildlife managers are developing a regional research, monitoring and evaluation plan that frames the needs and describes the activities necessary to gather information and gain knowledge critical to successful fish and wildlife management.

6) Regional Coordination of Activities.
The fish and wildlife managers are uniquely positioned to evaluate how activities funded under the Northwest Power Act relate to and can be integrated with activities funded under other programs such as the Endangered Species Act, Mitchell Act, state and tribal restoration programs, and federal land management and mitigation programs. These activities include identifying opportunities where ratepayer dollars can be "leveraged" by other funds, identifying opportunities to fund actions under other programs, and integrating activities under several programs in ways that increase efficiencies and effectiveness.

To provide these deliverables, fish and wildlife managers would conduct specific activities. Among these would be chairing the caucuses within the Columbia Basin Fish and Wildlife Authority (CBFWA). The costs of these activities would be reimbursable by BPA.

Approach

BPA has funded some individual fish and wildlife managers to participate in some forums. However, BPA has no consistent policy on what activities it will fund and at what level it will fund those activities. There has also been a growing concern voiced by members of the public that too much money is spent on "bureaucracy" and that these expenditures are hidden in contracts with the fish and wildlife managers. A mechanism exists to resolve both issues.

To ensure BPA funds are being fairly and equitably offered to all fish and wildlife managers for participation in regional forums, and that the level of funding is apparent to others in the region, BPA will provide funds to CBFWA members (Members) through the Columbia Basin Fish and Wildlife Foundation (CBFWF). As prime contractor with BPA, CBFWF would then disburse funds to Members for staff time and travel. Members requesting funds would submit statements of work to CBFWF. A statement of work would describe the deliverables (from the list presented above in the Scope of Work section). It would also describe the activities the Member would undertake to provide those deliverables and the costs associated with the set of activities proposed. The Executive Director of CBFWA would manage the contracts with the Members.

Because some Members have already budgeted funding for participation in regional forums in FY1999 project proposals or intend to include these costs in FY 1999 budgets developed under existing Memoranda of Agreement, this approach would be phased in over the next two federal fiscal years. The intent is to have this approach fully implemented in FY 2000. Those Members who have not included funding for participation in regional forums in FY 1999 contracts would pursue that funding through CBFWF. Members who have included funding for participation in regional forums in their individual FY 1999 project budgets may choose to remove that funding from those projects and pursue it through CBFWF.

Programmatic Context

The indigenous anadromous fish species most actively targeted for management in the Okanogan River Subbasin are spring chinook (extirpated) and summer chinook, sockeye, and summer steelhead. The goal is to restore sustainable, naturally producing populations to support tribal and

non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the watershed.

The mainstem suffers from extreme summer temperature, fine sediment, and low flow problems due to irrigation withdrawal. Stream bank erosion from overgrazing is found throughout the subbasin. Salmon Creek, once an important spring chinook stream, is now entirely diverted into an irrigation delivery system. Enloe Dam blocks access to more than 95% of the anadromous fish habitat in the Similkameen River, the Okanogan's largest tributary. Thermal and/or structural barriers exist on most tributaries within the subbasin.

In an attempt to meet the subbasin goal, the co-managers have adopted the following outcome-based objectives: 1) improve adult pre-spawning survival; 2) improve juvenile survival; and, 3) utilize supplementation to increase natural production.

The broad strategy for rebuilding and protecting Okanogan spring chinook combines habitat protection, passage improvements, harvest management restrictions, and supplementation with artificial production. Specific strategies include improving habitat through the use of habitat restoration and passage improvements and supplementing naturally spawning populations to enhance natural production. Project 9604200 funds the Colville Confederated Tribes to carry out Okanogan Watershed Planning and to implement habitat restoration. FY 1999 funding will address critical needs in Salmon Creek.

Protection of existing spawning and rearing habitat along with alleviation of survival problems in summer rearing/overwintering in the lower tributaries are critical objectives of the strategy. Specific recommendations of habitat protection activities are being developed and pursued through the mid-Columbia Habitat Conservation Plan currently under development. There is significant potential for increasing spawning and rearing habitat available to anadromous fish in this subbasin by addressing passage blocks such as Enloe Dam.

Supplementation is being implemented primarily through mid-Columbia PUD funding..